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COMPUTERWORLD

Novell fix speeds WAN traffic

BY JOANIE M. WEXLER
CW STAFF

PROVO, Utah — Novell, Inc. is poised to release a beefed-up version of its widespread IPX local-area networking transport protocol that will substantially boost file transfers across wide-area networks.

The tweaked protocol will allow users linking their LANs over wide areas to "fill wide-area network bandwidth with multiple, variable-length IPX packets" rather than leave costly bandwidth idle while IPX places small packets single-file onto the links, according to a government Novell Netware user who is testing the protocol.

The user, who asked not to be identified, said he has tested "Burstmode IPX," a version of the protocol that "provides nearly the performance of a 4M bit/sec. Token Ring across a T1 [1.5M bit/sec.] line."

A Novell spokeswoman would say only that "Burstmode IPX is not yet an announced product." However, Netware user Matthew Collins, corporate network administrator at Amex Life Assurance Co. in San Rafael, Calif., said Novell told him three or four months ago to expect delivery of Burstmode IPX within a few months.

"The problem I currently have with IPX is it is limited to a

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Wide-area aspirations

Netware Burstmode IPX highlights:

- Potentially speeds file transfers over a T1 line to near-4M bit/sec. Token Ring performance.
- Relieves Netware bottleneck and allows users to maximize bandwidth use on wide-area links.
- Allows multiple, variable-length frames to be sent when transferring files instead of fixed-size, small packets one at a time.
- Code sits on workstation and receiving Netware server.

Apple gains key ally for database access

IBI pact strengthens Macintosh corporate links

BY JAMES DALY
CW STAFF

CHICAGO — Apple Computer, Inc.'s push to become an indispensable cog in enterprise computing will receive a lift tomorrow when Information Builders, Inc. details a product that greatly broadens the Macintosh's links to corporate databases, sources close to the companies said.

Information Builders is expected to reveal that its Enterprise Data Access/SQL software will now support Macintosh clients. EDA/SQL is a universal router that translates front-end data access applications into SQL queries, routing the request to the appropriate database.

EDA/SQL, a key component of IBM's Information Warehouse framework, eliminates the need to use separate data access tools and SQL queries. EDA/SQL can query both relational and nonrelational databases but can write only to nonrelational databases.

EDA/SQL will support both Macintosh System 7.0 and AU/X, Apple's Unix operating system. It is slated to be available in December; pricing was not available last week.

EDA/SQL's support of the Macintosh, which will be disclosed tomorrow at the Database World conference here, is important to both firms: Apple is pushing hard to make corporate data more accessible from the Macintosh, while Information Builders gains a key ally in fulfilling its goal of having EDA/SQL access corporate database information from any machine. EDA/SQL now operates on IBM mainframes.

More links to come

Links with the Digital Equipment Corp. VAX and Wang Laboratories, Inc. VS platforms are expected in the next several months, sources said.

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DEC launches VAX attack

Fast boxes, repackaged software pique interest

BY SALLY CUSACK
CW STAFF

BOSTON — A charged-up Digital Equipment Corp. hit the ground running last week with a three-pronged strategy consisting of simplified software packaging, restyled licensing options and faster VAX computers said to beat the competition.

The challenge facing DEC now is convincing users to buy the new systems rather than wait for the reduced instruction set computing-based Alpha VAXs due out in 1992 and 1993.

"Overall, I think DEC is stepping in the right direction to win some users back that have strayed over the last year," said John Braucksieker, MIS director at Prctein Technologies, Inc. in St. Louis.

Unleashing the fastest CMOS chip in the industry — running at 83 MHz — DEC established itself with the VAX 6000 as the current price/performance lead-

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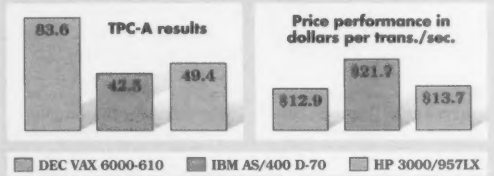
Top of the class

DEC achieves price/performance leadership in the midrange vs. comparable IBM and Hewlett-Packard systems market



Source: Digital Equipment Corp.
CW Chart: Marie Haines

Utility snubs IBM blueprint for enterprise networking

BY ELISABETH HORWITT
CW STAFF

NEWARK, Del. — Even true-blue IBM shops don't always play by the book. Delmarva Light and Power Co., which goes by the Blue book at its data centers, has turned IBM's recommended network management and enterprise networking strategies virtually inside out.

Slated for corporatewide implementation by year-end 1993, a new network architecture is expected to provide Delmarva with twofold benefits, according to the utility's network manager, John Scoggin Jr.

Maverick Scoggin *takes multivendor tact*

The company expects to spend 40% less per port for its user connections by replacing IBM communications controllers with third-party controllers and routers that provide more bang for the buck.

Longer term, it expects terminal-to-host response time to drop from about two seconds to six-tenths of a second. Delmarva even made IBM's vaunted Netview one of many network management packages.

While Delmarva's network operations department has always been somewhat at odds with IBM, it did not become a true maverick until 1989, when it began seeking ways to integrate the utility's existing Systems Network Architecture network with a growing local-area network installation.

The motivation behind Delmarva's move to merge its SNA and LAN traffic onto one backbone is the typical one: cost, Scoggin said. "We're very cost-conscious; we just filed our first rate increase in eight years."

Scoggin's group outright rejected IBM's then-emerging strategy of interconnecting its then Token Ring LANs over Delmarva's existing SNA backbone of front-end processors. "That's a bizarre thing to do," Scoggin said, describing it as "slow, awfully expensive and

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CA beats Borland to the punch by offering Dbase users a way to run applications under Windows. Page 8.

Expo attendees examine not if, but how they should migrate certain applications to Unix. Page 118.

Product Spotlight — You can get distributed capabilities in databases, but it may not be the functionality you need. Page 77.

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10 Users aren't sitting around waiting for **IBM** to come through with **AD/Cycle**; instead, they're using competitors' data dictionaries.

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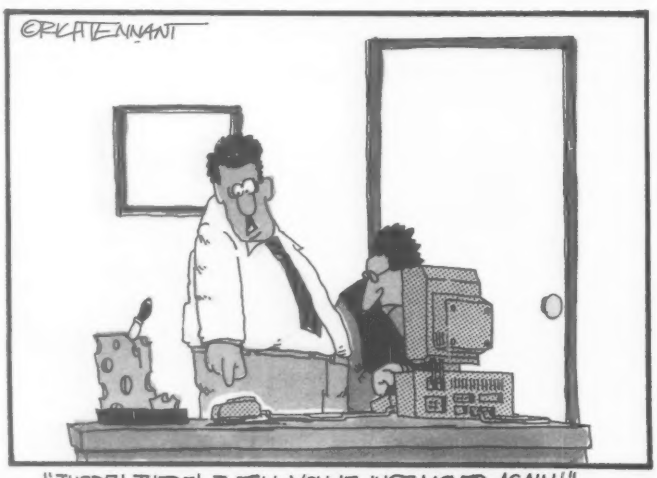

"THERE! THERE! I TELL YOU IT JUST MOVED AGAIN!"

EXECUTIVE BRIEFING

■ **DEC launched an aggressive three-pronged attack** last week to regain market share from IBM and HP. Its ammunition: faster VAXs, improved software packaging and revamped licensing policies. Users and analysts were upbeat on DEC's moves, with one observer saying the announcement shows the company's willingness to forgo short-term profits for longer term market share gains. But the big question is whether users will buy the new VAXs or wait for the RISC versions due out next year. **Page 1.**

■ **Vendors are building distributed functionality** into databases, but it may not be what users need. While vendors work on high-level distributed access, users are in search of more client/server-oriented features, such as better snapshot capabilities and heterogeneous access. **Page 77.**

■ **Apple will get another boost in the corporate market** this week with the expected announcement from Information Builders of a Macintosh version of its data access tool set, Enterprise Data Access/SQL. **Page 1.**

■ **Is your dream job pie in the sky?** An informal survey of top IS professionals reveals that you can reach your goals by working in various areas of a company, getting an MBA and taking a few risks. **Page 103.**

■ **Some longtime Comqaq corporate customers feel uneasy** after the recent sweeping changes, which included the ousting of founder Rod Canion. **Page 4.**

■ **True-Blue shop Delmarva Light and Power is putting its own spin** on IBM's enterprise networking strategy to implement what it says is a most cost-effective approach. **Page 1.**

■ **When purchasing an intelligent uninterruptible power supply (UPS) for a LAN,** systems managers should pay attention to the following: how the UPS connects to the server, compatibility with network operating systems and unattended operating abilities. **Page 111.**

■ **Vendors are promoting upgradable laptop computers,** but users may not be biting yet. While PC managers have said they like the idea of upgradable desktop machines, the ability to swap out a CPU board for a more powerful one wouldn't be a major factor in a buying decision for a laptop, they say. **Page 45.**

■ **Retirement plans may not be something IS managers want to think about now.** However, IS folks change jobs often and that means they frequently surrender pension benefits that might come in handy someday. **Page 65.**

■ **Users may still be committed** to the IBM AD/Cycle strategy, but many are charting their own short-term course with other vendors' repository products. **Page 10.**

■ **Charles Popper is the new IS chief** at the pharmaceutical firm Merck & Co. Popper, who recently started at Merck as vice president of computer resources, was formerly a partner at Deloitte & Touche. **Page 72.**

■ **Your IS strategy might be blocked by a "brain barrier" problem,** the Gartner Group says. The research firm reports that many U.S. firms are hesitant to change decades-old business practices. **Page 121.**

■ **On site this week:** Executive information system is the wrong term for what Alverno Administrative Services, Inc. is trying to do with an EIS-type project. The problem with the term 'EIS' is that it may shut out users below the higher executive levels, according to managers at the health services firm, which is building its 'business information system' using SAS Institute's SAS. **Page 37.** Home banking will get another try in Columbus, Ohio, when Huntington Bancshares launches a program using AT&T's new Smart Phone. **Page 60.**

Mead finds SYBACK performance critical to effective disaster recovery plan

The process of optimizing Mead Corporation's disaster recovery plan was an evolutionary one which began with the realization that our original recovery system could not restore lost data in an acceptable time period. With this as a starting point, we then identified and implemented a new high performance backup and restore product. This product—along with our disaster recovery plan—is periodically reviewed in hotsite tests to ensure timely data restoration in the event of a disaster.

Mead Corporation is a leading manufacturer of paper products, packaging, and office supplies, as well as a provider of electronic publishing services. Although we had been relying on our then-current data backup and recovery product for several years, we had never actually performance tested its capabilities. In anticipation of our first hotsite test to remedy that oversight, the early product was carefully examined, only to realize that we'd be in real trouble if we had to rely on it in an actual outage.

...we needed to fully recover the entire VM system in a hotsite test in under five hours.

One problem with that system was that our early base backups contained compressed data which had to be decompressed before the backup tapes could be used in a recovery operation.

SYBACK performed a complete base restoration of critical business data in just two hours and thirty-five minutes.

This presented a Catch 22 situation because the files needed to get the base system up could not be retrieved until they were decompressed. But the decompression could not be performed until the base system itelf was restored. As a result, if the hotsite was down for any reason, restoration would be virtually impossible at a cold site.

But even under the best of circumstances, the serious performance limitations of our early product would have required at least three days to restore business critical applications—such as Electronic Data Interchange (EDI), spreadsheet applications, financial analysis packages, and an internal communications application—in the event of a disaster.

Al Tokarsky, Senior Systems Programmer
Mead Corporation, Dayton, Ohio

Our first step in improving the recovery process was to define recovery standards. We decided we needed to fully recover the entire VM system in a hotsite test in under five hours. This represented such a sizable improvement over what was possible with the previous backup and restore system that we did not anticipate that another product could make this original objective too conservative.

In a recent hotsite test we began using a new data backup and restoration system, Syncsort/BACKUP (SYBACK) from Syncsort Inc., Woodcliff Lake, New Jersey, and found that our original target could not only be met, but halved. SYBACK performed a complete base restoration of critical business data in just two hours and thirty-five minutes.

To cut recovery time even further, Mead is continuing with a program of semi-annual hotsite tests which includes streamlining and fine tuning administrative procedures associated with the restoration process. For example, Mead is reviewing tape drive addresses to resolve conflicts, and further speed restoration. Similarly, directories are being checked to ensure correct virtual machine classes are specified. We have also found that by running a standalone SYBACK module directly the restoration environment can be simplified to eliminate the need for other tape management products.

The base backup tapes used in disaster recovery operations at Mead are created weekly and shipped offsite along with a listing of all tapes required for recovery, including NSS (name save system) tapes and the key SYBACK tapes. This weekly complete base backup is a physical, cylinder-for-cylinder representation of the DASD and can be restored faster than a set of daily incremental backups because it is not dependent on the CMS file structure. Verification of each file is not required.

In addition, Mead makes two incremental backups daily, sending the first copy offsite for secure storage, and keeping the second copy onsite for ad hoc file restores. The daily incremental tapes are cumulative, and include all data changed since the previous base backup was made. Each incremental backup typically incorporates 5000-6000 user IDs, while the full base generally has over 7700.

To restore the base system... only requires loading the key tape...the job proceeds automatically.

Unlike Mead's previous backup and restore product, SYBACK can operate as a standalone module and does not require uncompressed files. To restore the base system from tapes stored offsite only requires loading the key tape containing the base and incremental restore files and the SYBACK module. Since the volsers needed to run the recovery job are all in these files, no on-line catalog is needed. SYBACK then uses one file as input for the base restore, and with all DASD virtually attached, the job proceeds automatically. The only operator intervention required is for mounting tapes as prompted by the system.

Once the base is fully restored, Mead then restores the incrementals, a process which in the most recent hotsite test took just one hour and 40 minutes. Incremental restores are expected to proceed even faster with the latest release of SYBACK (Release 2.3) which includes a feature called RLF, short for reduced label format. This feature lets users restore incrementals faster because of reduced tape label processing.

Mead believes that a high level of disaster planning is essential for corporate survival. However, the key to success of any disaster plan is periodic hotsite testing. Without these tests the plan alone may lull companies into a state of inadequate semi-preparedness.

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Compaq users leery of change

BY MICHAEL FITZGERALD
CW STAFF

HOUSTON — Compaq Computer Corp.'s ongoing reorganization has created some unease among the firm's traditionally stalwart corporate customers.

While not expecting Compaq's vaunted quality to drop in the near term, some of these customers worry that the departure of founder Joseph R. "Rod" Canion, coupled with a sweeping restructuring, will affect the desktop computer maker's ability to build, service and support leading-edge products.

"I was always able in the past to justify the [price] delta [between Compaq and other clone makers], but with all this commotion, the delta is becoming increasingly difficult to justify," said Glenn W. Sandusky, chief information officer at Miller Mason & Dickenson, a benefits consulting firm in Chicago.

"They need to do something to calm the crowds," he said.

Disruptions caused by the reorganization could cost Compaq its preeminence in the short term, analysts said. Most analysts, however, said they expect the cost savings engendered by the restructuring to boost the company's long-term competitiveness.

"They're becoming just another player," said Frank Michnoff, program director at Meta Group, Inc. in Westport, Conn.

Few observers said they believe Compaq will suffer from losing Canion, but they conceded that there is simply too much change occurring at the firm.

Chairman Rosen *acknowledged that Compaq initially misread changes in the market*

"Canion's departure will not have a lasting negative impact on the company per se," said Bruce Lupatkin, an analyst at Hambrecht & Quist, Inc., a San Francisco investment banking firm.

Lupatkin noted that while other box makers managed to ride out the sales slump caused by the recession, Compaq stagnated. Eventually, Compaq's board realized the real problems were within Compaq and that Canion was not moving to address the changing market. "A whole host of competitors were growing rather nicely at Compaq's expense," Lupatkin said.

The company was overly attached to high profit margins and to its dealers at a time when customers were flocking to vendors that offered lower prices and a broader choice of distribution channels. Compaq, moreover, was slow to match the lower cost structures adopted by personal computer clone makers.

Financier Benjamin M. Rosen, Compaq's chairman, conceded that Compaq initially misread the market. He said the company was reorganizing in part because cost reduction is now on an equal footing with quality and performance.

"There is no reason why we cannot have costs as low or lower than anyone in the computer industry," Rosen concluded.

Canion's dismissal may have seemed sudden to the outside world, but Rosen said there was no easy way to make the change. "It's better for us, and it's better for Rod, and you each go on with your lives," Rosen said.

Canion could not be reached for comment last week.

Rosen said the board and Canion had been discussing a possible shift in power. He said Canion had submitted a plan that would create an office of the president, with power shared jointly by Canion and Eckhard Pfeiffer, Compaq's executive vice president and chief operating officer, who was named as Canion's replacement.

"We couldn't figure out how to have them both operate, so we opted instead to take the chance of losing one of them," Rosen said. The board unanimously decided that Pfeiffer was the better man to lead Compaq.

Hard-charging Pfeiffer raises eyebrows

A favorite story at Compaq about Eckhard Pfeiffer involves the way he launched Compaq in Europe in 1983.

"We sent Eckhard over with $20,000 and said, 'Establish us internationally,' " recalled Benjamin M. Rosen, Compaq's chairman.

At the time, Compaq barely had a presence in the U.S. Since then, Compaq Europe has established itself as a leading reason for the parent company's years of extraordinary growth, which ended abruptly this year. More than 50% of Compaq's sales come from overseas.

This picture of Pfeiffer as a gutsy entrepreneur with the leadership skills to build a $2 billion corporate division is overshadowed by questions raised by former Compaq associates and analysts about his management style and leadership skills. Pfeiffer has a reputation as a manager who has rubbed employees the wrong way by dictating policy instead of building a consensus.

Rosen disagreed with that assessment. "Eckhard is a person who is inquisitive and open, unlike the reports I've read," Rosen said. "He asks questions, and we've made more changes under his aegis in 1991 than we have in our entire history as a company before that," he added.

"I think he's a more pragmatic guy than most in the industry," added Bruce Lupatkin at Hambrecht & Quist. "He will probably carry less of a cultural burden than, say, Canion did as a company founder."

Pfeiffer was not available for comment last week.

Analysts said they expect Pfeiffer to make dramatic and rapid changes in the way Compaq does business, above and beyond what has been done. Meta Group's Frank Michnoff predicted more aggressive price cuts from the company.

MICHAEL FITZGERALD

Red ink foils Intellicorp, Knowledgeware nuptials

BY KIM S. NASH
CW STAFF

MOUNTAIN VIEW, Calif. — Intellicorp, Inc. last week nixed a planned merger with Atlanta-based Knowledgeware, Inc., after disclosing a $2.5 million quarterly loss and the departure of its chief executive officer.

Intellicorp, a Unix computer-aided software engineering (CASE) tools vendor, cited sinking stock prices at both firms and "better opportunities as independent CASE companies" as the primary reasons for dropping the deal.

Poor quarterly financials reported by both companies also influenced Intellicorp to turn down Knowledgeware's stock-for-stock offer, according to K. C. Branscomb, Intellicorp's president, who last week assumed the CEO post.

"Our board came up with the best decision for our shareholders," she said.

For its part, Knowledgeware has pledged to negotiate toward a joint marketing or development contract with Intellicorp. Knowledgeware's spokeswoman would not specify which products those talks focused on or when a deal might be struck.

The offer called for the two companies to exchange an undisclosed number of shares. "With Knowledgeware's and Intellicorp's stock beaten down so much since they announced the deal, the number of shares probably didn't equal the value of" Intellicorp, said Ed Acly, an analyst at International Data Corp., a market reseach firm in Framingham, Mass.

Knowledgeware stock has careened 18 points — or 60% — since late August, from 29¾ to 11¾ last Wednesday, when the merger was canceled. Intellicorp has declined 57%, from 3⅜ to 1 15/16.

Rumors swirling about regarding Knowledgeware's financial health likely influenced Intellicorp's seven-member board, according to Acly. Between shareholder lawsuits and doubts about Knowledgeware's accounting procedures, "it's not clear when or even if its stock will regain value," he said.

The merger would have been Knowledgeware's fourth acquisition this year and another step in its announced strategy to expand its product line beyond IBM mainframe-based CASE tools into new applications development areas and hardware platforms [CW, Sept. 2].

Knowledgeware reported preliminary fiscal 1992 first-quarter sales in the range of $20 million to $24 million, about half as much as fourth-quarter 1991 sales of more than $40 million.

Meanwhile, Intellicorp last week reported a first-quarter 1992 deficit of $2.5 million, a slight improvement over the same period last year when the company lost $2.9 million.

Branscomb assumes the CEO role from Chairman Thomas Kehler, who resigned to pursue other interests. A new chairman has not been named.

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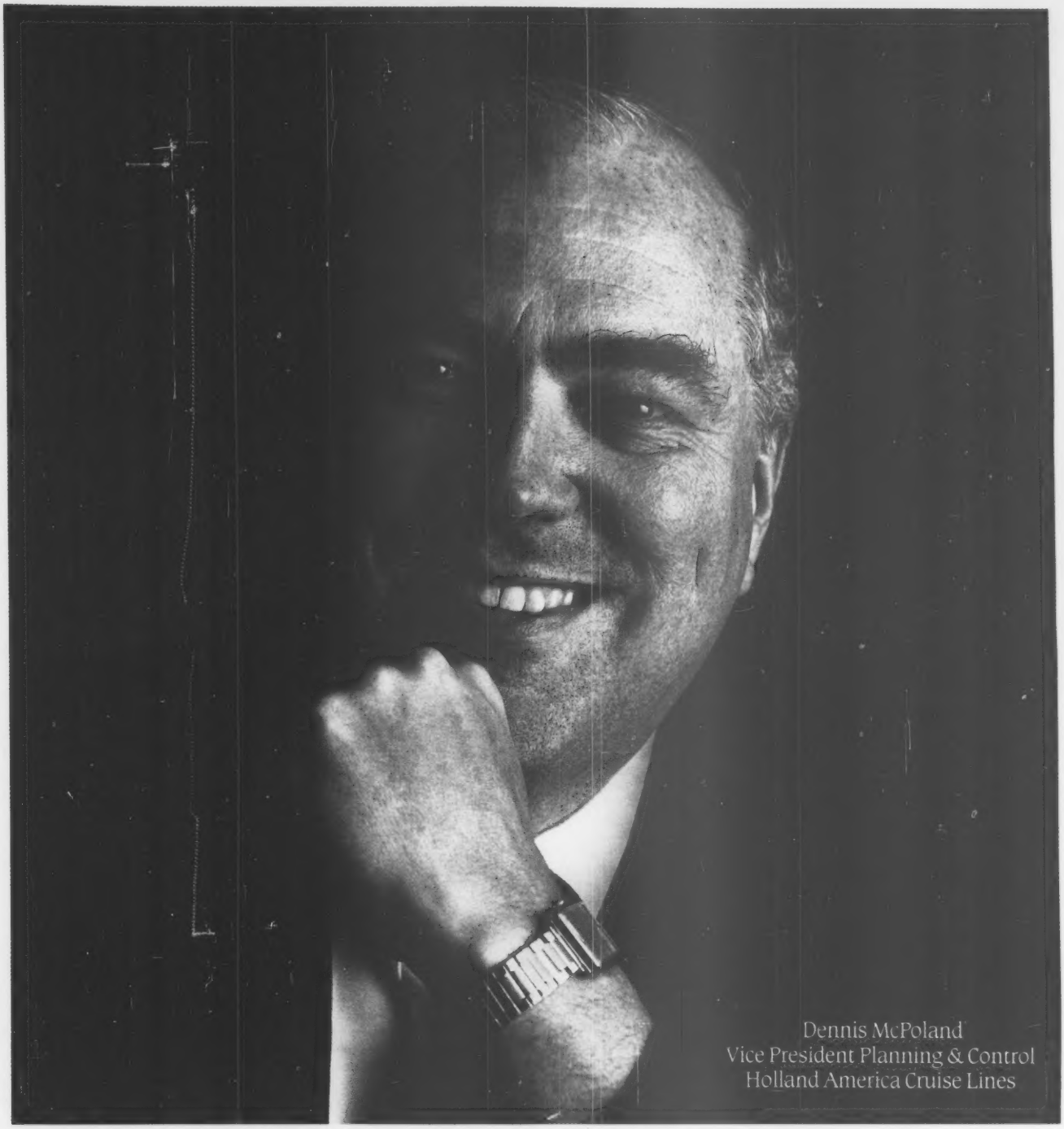

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DEC delivers licensing options

Up-front payments could translate into long-term savings for customers

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — "Buy as much as you need" is the operative theory behind Digital Equipment Corp.'s new licensing options, which analysts and users agreed are styled more toward desktop tastes than data center-size budgets.

However, the installed base may find it will have to pay a price up front, much like the fee homeowners pay when refinancing, in order to take advantage of the long-term cost savings.

DEC last week unveiled two licensing options — one for personal use and one for concurrent use — designed to give users greater flexibility and choice beyond its traditionally high-priced licensing based on system size.

Personal-use licenses assure each individual access to the application, while a concurrent-use license allows a set number of people, as opposed to prespecified individuals, to share an application. The latter policy taps into a growing trend in desktop software licencing (see story below).

A $25,000 software license to run Lotus Development Corp.'s 1-2-3 spreadsheet on a VAX 6000, for example, will now be available at $595 for a personal-use license or $1,495 for concurrent use.

DEC allows the licenses to be moved freely between processors or reassigned to different users. Of the more than 200 DEC software products now licensed on VAX/VMS and Ultrix systems, 120 products will offer personal-use licenses, and 85 products will offer concurrent-use licenses.

"Long overdue," said Kevin Oberman, network manager of the Engineering Division at the University of California's Lawrence Livermore National Laboratory in Livermore, Calif. "It all sounds amazingly rational."

Oberman echoed the comments of other users, who said DEC could well end up selling more hardware and software under the new scheme.

As a beta-test user for Lotus' 1-2-3 spreadsheet on the VAX a few years ago, Oberman recalled how his department had to "toss it in the trash can" after the beta-testing ended. "The license would have cost us multiple thousands on our Vaxcluster, and for two people to use it, that doesn't cut it," he said.

DEC's move is clearly intended to staunch the flow of DEC customers downsizing from larger systems to personal computer-based local-area networks and workstations.

"Our software pricing had become a disincentive to hardware upgrades," acknowledged Mary Welch, manager of software business practices at DEC.

Exactly right, said John Braucksieker, MIS director at St. Louis-based Protein Technologies, Inc., a subsidiary of Ralston Purina Co.

Before the licensing options appeared, Braucksieker was preparing to add a third-party accelerator product to his Vaxcluster rather than escalate his software costs by adding another VAX 6000.

"Our company and users don't grow as significantly as our applications and CPU requirements do, so it's a godsend," he said of the licensing options.

For the installed base, DEC will offer an upgrade path to the new licenses that essentially cashes in the system license for a number of personal- or concurrent-use licenses — plus a 15% premium for the transaction.

Users may not object too strenuously to that 15% premium, analysts said, since they can always stick with traditional systemwide licenses. For corporatewide use of office software, such as DEC's All-In-1, keeping the unlimited-system-use license may be the most sensible course, DEC officials noted.

Make it simple
DEC revamps its software licensing scheme

Example: Adding VaxC to a two-node cluster of VAX 6000s

Before	After
Option 1 License entire cluster for VaxC — $23,700 **Option 2** License one processor for VaxC — $13,500	Three VaxC personal-use licenses — $3,210

Source: Digital Equipment Corp. CW Chart: Michael Siggins

Users warm to changes in Wordperfect fees

BY CAROL HILDEBRAND
CW STAFF

OREM, Utah — Wordperfect Corp.'s recent softening of its software licensing stance was greeted with user approbation as one of the last of the hard-liners finally acknowledged the movement toward liberal licensing trends.

Wordperfect's Peterson *changed licensing to what people think is fair*

"Most of our problems come from users who just cannot understand why they can't have two copies," said Ed Johnson, a microcomputer analyst at Snap-On Tools Corp. "This will make it easier for us to police."

Wordperfect, which owns an estimated 65% to 70% of the character-based word processing market, has been drawing criticism in recent months for its insistence on a "one license, one copy" licensing policy [CW, Aug. 5]. With more businesses moving desktop applications onto a network, such a rigid policy could end up losing business for Wordperfect.

"What we tried to do was change our licensing to be more in line with what most people thought was fair," said W. "Pete" Peterson, executive vice president at Wordperfect.

Two policy changes address concurrent-use licensing and the separate issue of shadow copies, which refers to users making copies of their office packages for laptop or home computers.

Under the new policy, which Peterson said would go into effect with the Nov. 11 release of Wordperfect for Windows, users are now allowed to make shadow copies.

"Basically, you can put another copy on a laptop or home machine as long as it's not being used at the same time as the first computer," Peterson said.

The company is also supporting concurrent-use licensing on a network for the first time. For example, if a network of 100 users has only a maximum of 50 users with Wordperfect up at any one time, only 50 licenses are needed. Up to 50 copies may also be stored on local hard disks on the network.

The changes also included, for the first time, a 30-day, money-back guarantee on the company's product.

"I am so thrilled," said Linda Deinberg, network manager at Fujisawa Pharmaceutical in Deerfield, Ill. "Their policy was sticking out like a sore thumb."

DEC launches three-pronged VAX strategy

CONTINUED FROM PAGE 1

er against comparable IBM and Hewlett-Packard Co. machines.

"I think this is a dynamite announcement," said George Reid, director of MIS at Sanford C. Bernstein and Co., a money management firm in New York and a DEC shop. "We've bought a 6000 Model 600."

The VAX 6000 Model 600 systems offer price/performance of $12,900 per transaction per second, handily beating out both IBM's Application System/400 and RISC System/6000 offerings, as well as Hewlett-Packard's 3000 and 9000 series computers (see box).

The vendor also announced a new version of the VMS operating system, additions to the VAX 4000 midrange line and two new Vaxstations.

For geographically dispersed data centers, DEC unveiled disaster-proof Vaxcluster systems connected by Fiber Distributed Data Interface networking at distances of up to 25 miles.

"DEC is in a new era," said Peter Schay, vice president of midrange computing strategies at Gartner Group, Inc. Schay said DEC is moving aggressively in the price/performance area and seems ready to sacrifice short-term profits for long-term market share.

DEC has also repackaged its Network Application Support (NAS) software to give users an integrated suite of existing products, deliverable on either compact disc/read-only memory or magnetic tape format. NAS includes a host of layered software products, such as Decwindows, that allow users to integrate, port and distribute applications over multivendor systems, including VAX/VMS, Unix, MS-DOS, OS/2, Apple Computer, Inc. Macintoshes and Sun Microsystems, Inc. systems.

Christened NAS 200, NAS 300 and NAS 400, the products are respectively configured for work-group level, departmental and enterprisewide computing applications.

The NAS 200 and 300 server products support both VAX VMS and RISC/Ultrix environments, while NAS 400 runs only under VMS at this point.

Analyst and user reaction to the new NAS packaging was uniformly favorable.

Joseph Payne, an analyst at Alex. Brown and Sons, Inc., estimated there is a $15 billion, five-year market waiting for DEC with its repackaged NAS products. At present, DEC's Software Products Division is earning about $1 billion a year in revenue, Payne said.

"Competitors will be scared to death of this thing," he added.

Payne also noted that while Alpha RISC VAXs will start arriving next year as development workstations, it will take two to three years for commercial-strength software to catch up.

VAXing philosophical

New VAX/VMS systems

VAX 6000 Model 600 systems (Models 610-660)
- Incorporate the fastest CMOS CPU (83 MHz) available.
- Priced between $247,000 for a 64M-byte system to $659,000 for a six-processor, 128M-byte system.
- Ships Nov. 25.

VAX 4000 Model 500 system
- Provides three times the performance and twice the memory of the VAX 4000 Model 300.
- Pricing ranges from $133,000 for a 64M-byte system to $580,630 for a dual 128M-byte system. Servers start at $100,765.
- Ships in December.

Vaxstation 4000 Model 60
- 10.6 Specmark CPU performance.
- Priced from $5,995.
- Ships Nov. 25.

Vaxstation 4000 VLC
- Provides up to 24M bytes of memory.
- Priced at $3,450.
- Ships Nov. 25

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"ORACLE Server's performance shined on database queries that required complex aggregations—sometimes more than twice as fast as other products...

"In selecting ORACLE Server as the winner, the judges considered other factors such as product maturity and experience with corporate databases, and the selection of front-end tools to access the database.

"(And) even though the NLM version of ORACLE Server was new, it was considered to be a close extension of the firm's OS/2 and Unix products, which are proven technology on client/server platforms."

—PC Week June 24, 1991

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NEWS SHORTS

UTI eyes IBM for outsourcing pact

Negotiations between United Technologies, Inc. and IBM's longtime outsourcing subsidiary, Integrated Systems Solutions Corp. (ISSC), are momentarily expected to result in a letter of intent for a multibillion-dollar outsourcing deal that will put ISSC in charge of the Newington, Conn.-based data center that serves three of United Technologies' eight divisions.

Freeport-McMoRan names CIO

Andersen Consulting partner Michael J. Arnold was named by Freeport-McMoRan, Inc. last week as its first-ever vice president and chief information officer. Electronic Data Systems Corp. provides its information systems services, but Arnold has been involved with Andersen systems integration projects at Freeport-McMoRan since 1978.

IBM winnows down software unit

New homes have been found for two more of the programs orphaned by the demise of IBM's Desktop Software unit. Marketing and distribution rights for the Signature word processor have been assumed by co-developer Xyquest, Inc. Expected to ship this month, Signature is the next step up for Displaywrite users. In January, Advanced Business Microsystems, Inc. (ABM) will take over U.S. marketing and distribution rights to The Platinum Series, IBM's accounting and management software package for OS/2 and DOS. ABM plans to begin marketing the product under its own logo in January 1992.

CASE working on the railroad

The Consolidated Rail Corp. in Philadelphia has signed up for $1 million worth of Andersen Consulting's Foundation computer-aided software engineering (CASE) products. The tools will be used to plan and design cooperative processing applications that will integrate all customer-related and real-time operations, including scheduling, inventory control, train management and switching.

High court backs Baby Bells' entry

The U.S. Supreme Court ruled that the seven regional Bell telephone companies may immediately offer information services. A lower court ruling last month gave the Bells the green light to own and process data, but a coalition of would-be competitors sought to temporarily block that order pending an appeal. Pending legislation provides another bar.

Research lab bets on RISC

The University of California Lawrence Livermore National Laboratory last week chose IBM's RISC System/6000 to fulfill a $1 million contract providing Unix-based computer servers to the lab's Open Computer Facility. The lab will replace a Cray Computer Corp. XMP supercomputer and an Amdahl Corp. mainframe with a networked cluster of 14 RS/6000 Powerserver 550s running AIX Version 3, IBM's Unix variant.

IRS boosts tax-simplification bill

The Internal Revenue Service last week threw its weight behind a bill in Congress that would extend the amortization period for software and other intangible assets to 14 years. Most firms write off software in five years or less, and the measure would boost the effective cost of software by deferring tax deductions [CW, Oct. 7]. The possibility exists for setting up shorter schedules for short-lived assets.

Group for software reuse formed

IBM, Unisys Corp., the U.S. Army, the National Institute of Standards and Technology and 16 other corporations and federal government groups have formed the Reuse Library Interoperability Group. The consortium will draft and propose standards that will make it easier to transfer reusable software components between libraries.

Casualties of IBM/Comdisco war

Users, leasors could bear the brunt of attack on memory board swapping

BY NELL MARGOLIS
CW STAFF

Signs of settlement in the IBM/Comdisco memory board suit flared briefly last week when a federal judge suspended court action and ordered the firms to sit down and talk. But hopes for an early end to the hostilities fizzled as the week wore on.

Industry observers fear the leasing and resale market's already fragile credibility and used-computer users' peace of mind will be the the first and worst casualties if the acrimonious controversy drags on.

IBM and Comdisco, Inc. continued to hurl countercharges last week over questions surrounding allegedly bogus memory boards that appear to have turned up in some IBM mainframes sold by Comdisco on the secondary market.

Comdisco conceded reconfiguring IBM memory but maintained that the practice stopped short of remanufacturing and stopped altogether last winter, when confusion arose over whether IBM would extend maintenance to machines bearing such boards. Comdisco also said the boards were at least equal to their IBM originals in quality.

In a statement to customers, Comdisco offered those in possession of the allegedly tainted memory the option of replacement with an IBM or compatible product or a lifetime third-party maintenance guarantee.

IBM quickly characterized Comdisco's offer as an admission of guilt and an attempted end-run around the lawsuit.

A daylong meeting among executives of the embattled firms last Thursday resulted only in "some progress toward agreement" on minor procedural points regarding the litigation, an IBM spokesman said.

No substantive issues were resolved. The parties are due to be in court again this Wednesday.

Meanwhile, one memory market expert sent out a hopeful message to users confused by the suit-related verbal barrage:

"Computer memory burns in," said Tony Coppola, president of Computer Products Marketing, Inc., a Laguna Beach, Calif.-based consulting firm serving the plug-compatible memory market. Whatever the legal resolution of the IBM/Comdisco dispute, Coppola said, "this is not a virus watch. This is not a degradation issue. Once a computer memory has played for around 30 days, it's going to keep right on playing."

CA forges ahead with Dbase for Windows

BY JAMES DALY
CW STAFF

GARDEN CITY, N.Y. — A dark horse will take the lead in a field of vendors building Dbase-compatible systems for Windows this week when Computer Associates International, Inc. ships a multiuser version of the Dbfast database and development language, a technology it acquired only weeks ago.

CA's entry will establish it as an early front-runner in what is expected to be a highly competitive market: Dbase enjoys an installed base of approximately 3.5 million users, or about 47% of the personal computer database market, according to International Data Corp. estimates.

Several other software vendors are working on Dbase Windows products but are months away from completion. Borland International, Inc., which acquired the Dbase technology in its $439 million buyout of Ashton-Tate Corp. in July, is not expected to release its Microsoft Corp. Windows version of Dbase until the first half of next year. Fox Software, Inc. and Nantucket Corp. have similar products slated for a 1992 release.

"Dbfast is here and now, and that's a big, big advantage," said Rick Dexter, a Dbase user and associate at consulting firm Michael Price Associates in Menlo Park, Calif.

However, CA will need to do more than beat competitors to market. It will also need to beat the buggy reputation Dbfast had when CA bought it in September from Gensoft Development Corp. "We did a lot of cleanup, weeding out the bugs and stabilizing the code," CA product analyst Craig McLeod said.

Analysts, however, remain unconvinced. "Dbfast had an awfully rocky history. It depends on what CA has done to fix it," said Pat Adams, president of DB Unlimited in Brooklyn, N.Y.

Others said they plan to wait for the Borland or Fox product. "I'm not sure that there would be any advantage jumping over to an interim product," said Paul Von Fange, a senior analyst at 3M Co. in Minneapolis.

CA officials said they hope the $550 Dbfast attracts "pull-through" users who want to move Dbase applications to Windows while protecting their investments in DOS applications.

"I think it's going to be difficult, if not impossible, to ensure complete compatibility," said Shaku Atre, president of consultancy Atre/Intec, Inc. in Rye, N.Y.

The future of Dbase has been an issue of concern for users since Borland purchased Ashton-Tate. Borland Chairman Philippe Kahn has said he will at minimum upgrade Dbase to a Windows version. Borland will also continue to sell and support existing versions of Dbase IV across multiple operating systems, including the Apple Computer, Inc. Macintosh, Digital Equipment Corp. VAX and Sun Microsystems, Inc. platforms.

"We will protect customer investments," Kahn said.

After that, the situation becomes less certain. Borland plans to take both Paradox and Dbase customers to a new generation of database. That migration path will be paved by the Object Dbase compiler, which will include a programming language and other software to create applications that can share data from Paradox, Dbase and other programs.

Dbfast data files are compatible with Dbase III Plus and Dbase IV. Users can run Dbase III Plus and Dbfast simultaneously with shared data.

Opening Dbase windows

CA targets Dbase III+ and Dbase IV users who want to get into graphical computing

	1988	1989	1990
Dbase III+	100	260	376
Dbase IV	300	390	138
Total market	1.1M	1.4M	1.5M

Number of worldwide shipments (in thousands)

Source: Dataquest, Inc. CW Chart: Marie Haines

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Users find IBM repository alternatives

BY ELLIS BOOKER
CW STAFF

CHICAGO — Users are not sitting around waiting for IBM's vaunted AD/Cycle repository to evolve into a full-featured product. Instead, they are using other data dictionaries in their computer-aided software engineering (CASE) projects.

Many of the 225 attendees at last week's second annual Repository AD/Cycle International Users Group here zeroed in on strategic modeling and how any data dictionary, coupled with CASE tools, can have tremendous business benefits. Few groused about the slow evolution of IBM's Repository [CW, Oct. 21].

IBM's Repository Manager was introduced two years ago as the key management component of its AD/Cycle applications development environment. However, the initial version was incomplete and so difficult to work with that IBM said it was intended for developers or highly sophisticated users.

Noting that his group is composed of "doers rather than tire-kickers," Charles E. Walton, vice president of administration for the 500-member user group and managing director at Synergy Management Associates based here, said many users had implemented other vendors' repositories as interim steps to migrating to IBM's heralded Repository.

The big 'R'

"Everyone here is concerned about big 'R,' " Walton said, referring to IBM's Repository. But he added that these customers had "in most instances bought into the IBM Repository-AD/Cycle strategy" and were committed to waiting for it.

That is the approach being taken by Blue Cross/Blue Shield of Kentucky, which is evaluating an "interim DB2-based repository," said Mark F. Vreeland, lead Repository administrator at the Louisville, Ky., insurer.

Analysts confirmed the trend for users to turn to interim solutions while keeping their sights set on IBM. "There's always that gap between expectations and reality," said Geoffrey Staples at Nims Associates, Inc. in Dallas. "Everyone would like IBM to be five years ahead of where they are; you'd like to have a car that got 75 miles to the gallon, too."

According to Staples, some IBM executives in fact welcome the idea of customers trying simpler dictionary and CASE tools before stepping up to the Repository and AD/Cycle. "If you can't fly a Piper Cub, don't bring in a 747," Staples said.

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Workstation vendor takes the high road

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. is expected to announce today a new set of high-end systems for advanced visualization applications.

The move pushes Silicon Graphics' current Powervision VGX workstations and servers from its current high-end perch to the midrange. The repositioning coincides with a $30,000 price drop to $49,900 for the entry-level VGX workstation. The systems start at $79,900 and will be available in December.

Silicon Graphics Vice President Thomas Jermoluk said today's introduction is "one of the most aggressive moves" in company history because it will drop the firm's high-end graphics capabilities down to the midrange only 18 months after the VGX systems were introduced.

Enhanced graphics

With enhancements to the VGX graphics architecture, the VGXT systems can draw textured three-dimensional surfaces up to three times faster than VGX systems.

"This is part of Silicon Graphics' [strategy] to introduce technology at the high end and eventually bring the technology down to lower and lower prices," said Ken Anderson, an analyst and author of "The Anderson Report," a computer graphics newsletter.

VGXT systems include one to eight parallel processors, offering up to 286 million instructions per second. They are based on the Mips Computer Systems, Inc. R3000/R3010 reduced instruction set computing processors and run the Irix 4.0 version of the Unix operating system. The new systems will be offered in deskside configurations with up to four CPUs and in a rack-mounted version with up to eight CPUs and more than 12G bytes of internal disk storage.

In 1990, Silicon Graphics held 5.4% of the $7.3 billion technical workstation market, according to figures from Dataquest, Inc. Sun Microsystems, Inc. leads that market with a 30% share, followed by Hewlett-Packard Co.'s 23% and Digital Equipment Corp.'s 18% share.

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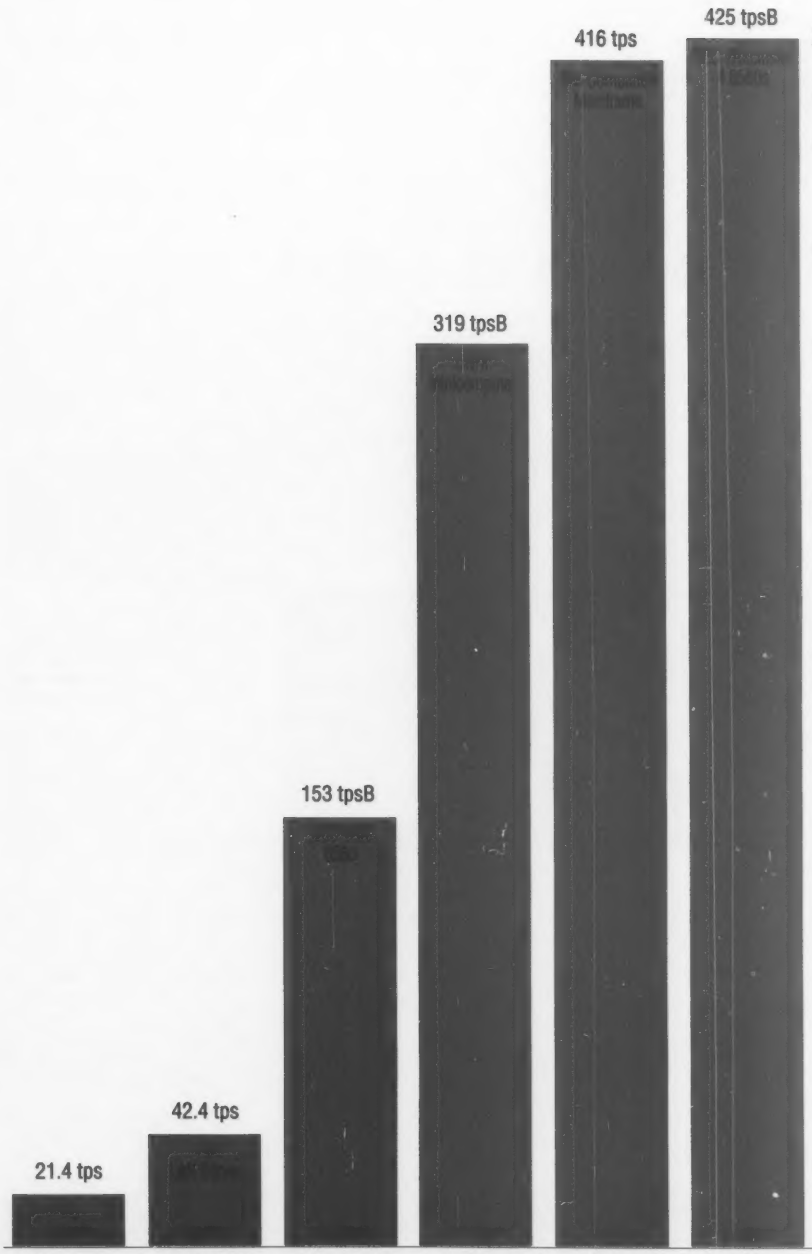

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Thinking Machines thinks big

Speed enters new dimension with massively parallel supercomputer

BY MICHAEL ALEXANDER
CW STAFF

CAMBRIDGE, Mass. — Thinking Machines Corp. introduced a radically new massively parallel processing supercomputer last week with a peak performance of 1 trillion instructions per second, far speedier than any other computer ever built.

To put that in perspective, a supercomputer capable of 1 trillion floating-point operations per second (FLOPS) could run in one day what it would take a Cray Computer Corp. supercomputer one year to run, said Danny Hillis, co-founder and chief scientist at Thinking Machines.

The firm also announced that it has inked a pact with IBM and Sun Microsystems, Inc. to develop a programming standard that will allow the same application written in Fortran to run unmodified on workstations, mainframes and supercomputers.

The building block of Thinking Machines' CM-5 Connection Machine supercomputer is Sun's reduced instruction set computing (RISC) chip-based Scalable Processor Architecture (Sparc) microprocessor. "We used a Sparc processor because it currently has the largest base of existing third-party software," Hillis said.

Processor points

The CM-5, which runs SunOS, can be equipped with 32 to 16,000 processors and can operate from 4 GFLOPS to 1 TFLOPS. Each processor, a 22 million instructions per second RISC chip, is packaged in a node with four 64-bit vector units for floating-point calculations, providing a total of 128 MFLOPS peak speed. Each node costs about $20,000. The machine is currently shipping.

The CM-5 sidesteps the programming bottleneck that has hindered the acceptance of massively parallel processing machines in the business world, Hillis claimed.

The parallel processing industry has been divided into two camps on the issue of whether all processors should run the same instruction simultaneously or if each of the processors should execute a different instruction simultaneously, Hillis explained.

The first technique, called single instruction, multiple data (SIMD), is easier to program but inefficient for some problems. The second, called multiple instruction, multiple data (MIMD), is more difficult to program but permits greater flexibility. The CM-5 runs both SIMD and MIMD programs, Hillis said.

The joint effort to develop a common software standard helped clinch the sale of two of the new supercomputers to American Express Co., said Steve Cone, senior vice president of direct marketing at American Express Travel Related Services Co. The company had "seriously considered" an Intel Corp. parallel processing machine until learning of the pact, Cone said.

Working together

"We're pleased IBM and Thinking Machines are working together because that will allow us to move applications from our IBM mainframes to the Connection Machines," Cone said.

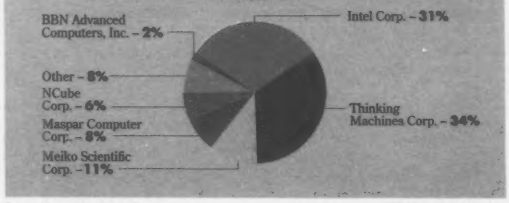
The CM-5 computers will be used to enhance customer service by speeding the collection of billing data for card members and merchants, Cone added. He declined to elaborate further.

The largest machine on order is a 1,024-node CM-5 that is being built at a cost of $25 million for the Los Alamos National Laboratory in Los Alamos, N.M. Officials at Schlumberger Ltd. as well as eight federal goverment and university research centers also announced plans to acquire the new machines.

Cerebral systems

Thinking Machines remains the market leader in the massively parallel systems business despite inroads made by Intel

1991 projected percent of market share by revenue
Total:$261M


BBN Advanced Computers, Inc. – 2%
Intel Corp. – 31%
Other – 8%
NCube Corp. – 6%
Maspar Computer Corp. – 8%
Thinking Machines Corp. – 34%
Meiko Scientific Corp. – 11%

Source: International Data Corp.
CW Chart: Tom Monahan

Object group reveals multivendor network standard

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — The Object Management Group (OMG) last week unfurled a standard for sending objects around multivendor networks and said products based on the standard should appear within two years.

That schedule appears to jibe with timetables set by many information systems shops, which expect to begin implementing production-level, object-oriented systems by 1994 at the earliest, observers said.

"It's just not practical yet to develop large applications using object-oriented technologies," noted Edward Hoerner, director of infrastructure implementation and standards at GTE Telephone Systems operations in Irving, Texas.

Hoerner added that he has a multiplicity of development issues to resolve before addressing object-oriented techniques.

The OMG standard, called the Object Request Broker (ORB), aims to standardize the communications mechanism for passing messages to and from objects.

Although object-oriented languages and databases have been available for several years, the ORB represents an attempt to link these together cohesively.

The basic premise of object-oriented programming is that business functions and applications are broken up into classes of objects that can be reused. This will allow users to significantly reduce the time it takes to develop systems, according to the technology's promoters.

The ORB is being positioned by the OMG, an 18-month-old consortium of 180 vendors, as the essential communications element on which other object-oriented technology will be built. Still needed, however, are tools and services with which to build an entire object-oriented framework, from software development to graphical user interface packages.

Possible skepticism

Some OMG members questioned the level of interoperability among different vendors' ORB products if, as with most standards, vendors build their own functions and features on top of ORB.

"Everyone will essentially have their own ORB," said Nelson Hazeltine, director of architecture and system management at NCR Corp. in West Columbia, S.C. NCR was one of six companies that contributed technology for the ORB.

Initial ORB products will enable systems and software vendors to build off-the-shelf packages for IS departments and end users, the standard's backers said.

Hyperdesk Corp., based in Westboro, Mass., will deliver an ORB-compatible development system in January that reportedly will allow software vendors to build distributed object-oriented systems. NCR will also incorporate ORB into a version of Cooperation, its Unix-based, cooperative-processing environment, which is slated for release in the second half of next year.

Sunsoft, Inc. and Hewlett-Packard Co. are jointly developing a distributed management system that will be compatible with ORB and is due to be delivered in the second half of 1992.

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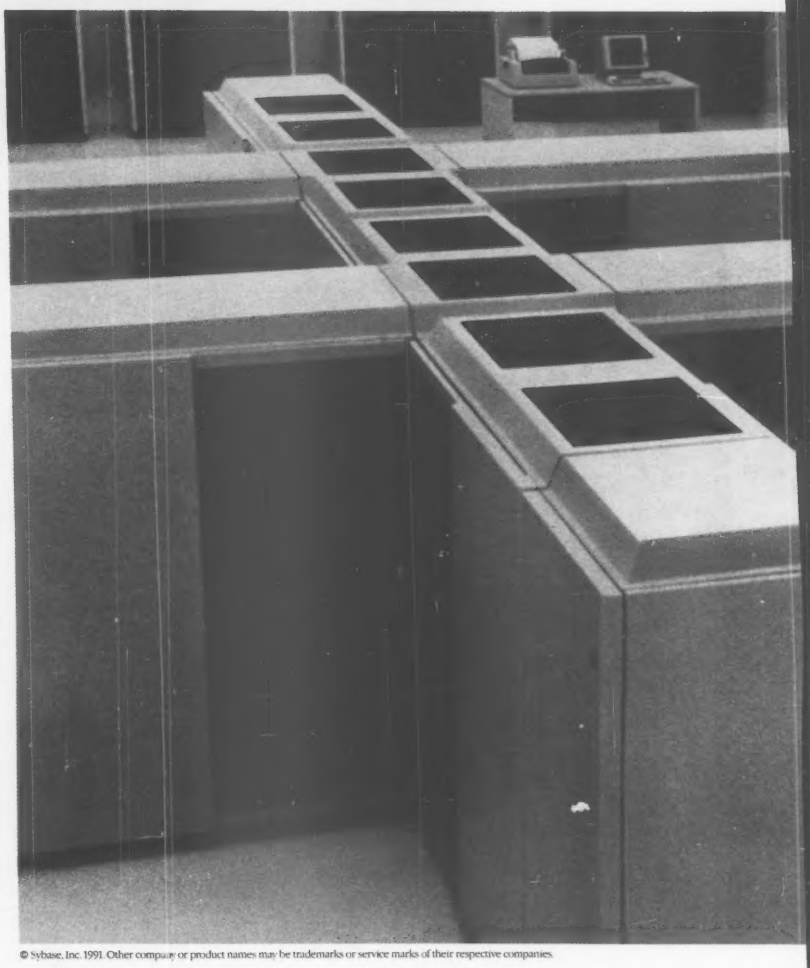

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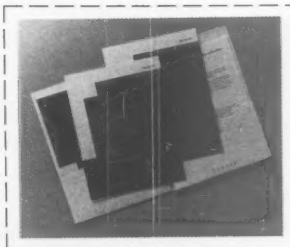

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DG skates thin ice to profitable fourth quarter

BY KIM S. NASH
CW STAFF

WESTBORO, Mass. — Brisk sales of Aviion workstations and a corporate restructuring helped Data General Corp. keep its head above water for the fourth straight quarter, company executives said last week. But 1992 profits are not a given, they warned.

"If 1992 revenues match this year, then we'll make money. But the economy, both here and in Europe, is pretty tough," said Ron Skates, DG's president and chief executive officer.

DG ended a five-year string of losses when it closed out fiscal 1991 on the plus side (see chart). The company pulled in $19 million in operating income for the fourth quarter vs. a loss of $88 million in 1990, despite a sales dip for the period from $309 million in 1990 to $296 million this year.

Measures to cut operating costs paid off, including selling its Japanese subsidiary for $13 million and slicing almost $39 million from research and development. The R&D cuts will not hurt because they do not take money away from DG's core product line, according to Skates. "We're spending more on our proprietary Eclipse line than ever before," he said. He would not name a figure, however.

Even as the march toward "open systems" rages on, DG's proprietary midrange Eclipse MV line continued to bring in the bulk of business, making up 55% to 60% of 1991 sales, said Steve Baxter, vice president of corporate marketing. With an installed base of 42,000 worldwide, Eclipse business is "crucial to us," he said.

DG's Skates: *'92 profits not a given*

However, sales of the 2-year-old Aviion Unix workstation family showed the highest year-over-year growth, accounting for 35% of DG's total 1991 revenue, up from 17% in 1990.

DG's prospects for next year remain uncertain. The company, which has relied heavily on government business, will continue efforts to penetrate the commercial market by pitching Aviion servers to health care and manufacturing firms.

Still, DG is counting on the $10 million worth of federal contracts signed this year to "make a significant contribution" next year, Baxter said.

Staying in the black — Data General

Data General has rung up four consecutive profitable quarters after several years of losses

1991 (in millions)	Q1	Q2	Q3	Q4
Revenue	$311.7	$320.4	$301.2	$295.6
Income	$12.4	$19.2	$35.6	$18.4

Source: Data General Corp. CW Chart: Michael Siggins

Health firm cuts could impact IS

BY CLINTON WILDER
CW STAFF

MORRIS PLAINS, N.J. — The information systems operation at Warner-Lambert Co. prides itself on data center efficiency, but it may have to get even leaner — and not by choice — by the end of the year.

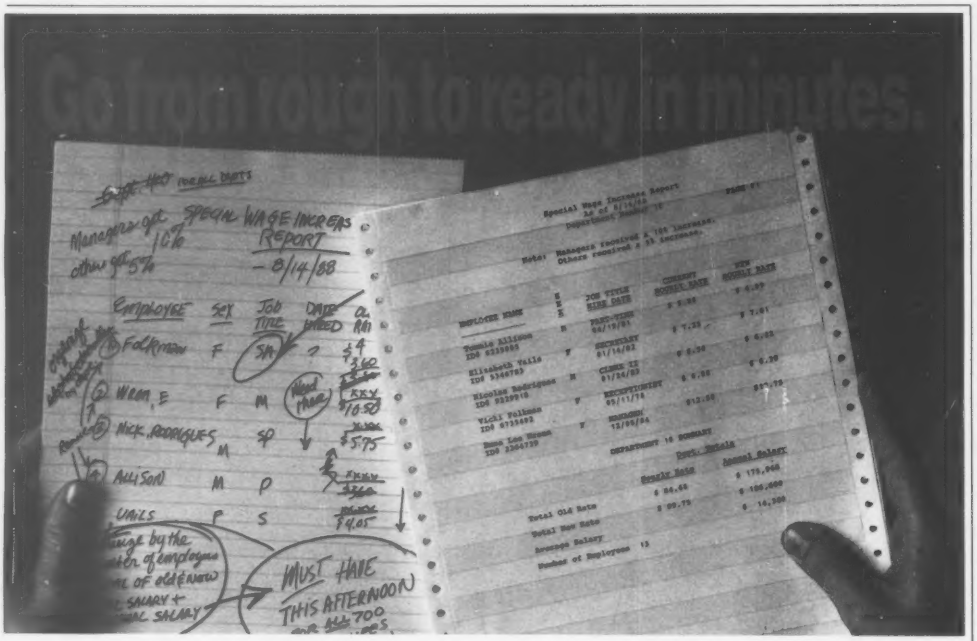
The $4.8 billion consumer health products and pharmaceuticals firm announced a work-force reduction of 2,700 people last week as part of a $524 million restructuring. The IS function will be affected, although no specific cuts have been announced. "It's premature to talk about any specific area at this time, but I'm sure it's going to affect a lot of areas," said James Oster, group director of international management information services.

About 340 positions will be eliminated at corporate headquarters here, where Warner-Lambert operates an IBM 3090-based data center. The firm refused to disclose the size of its IS staff.

Two thousand jobs will be cut outside of the U.S., most of them in manufacturing operations, a spokesman said.

The company simultaneously reported third-quarter profit growth of 15% but said the cuts were a hedge against a potential business downturn in the next two years. The spokesman said Warner-Lambert hopes to eliminate as many positions as possible through voluntary severance and pension incentive plans, then decide on layoffs by the end of the year.

Through efficiency measures, such as an expert system help desk, Warner-Lambert's data center has reduced its chargeback rates by more than 50% since 1985 [CW, April 16, 1990].



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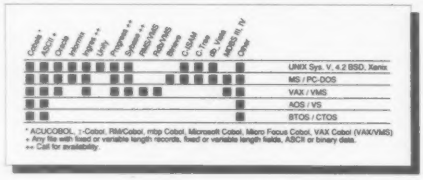

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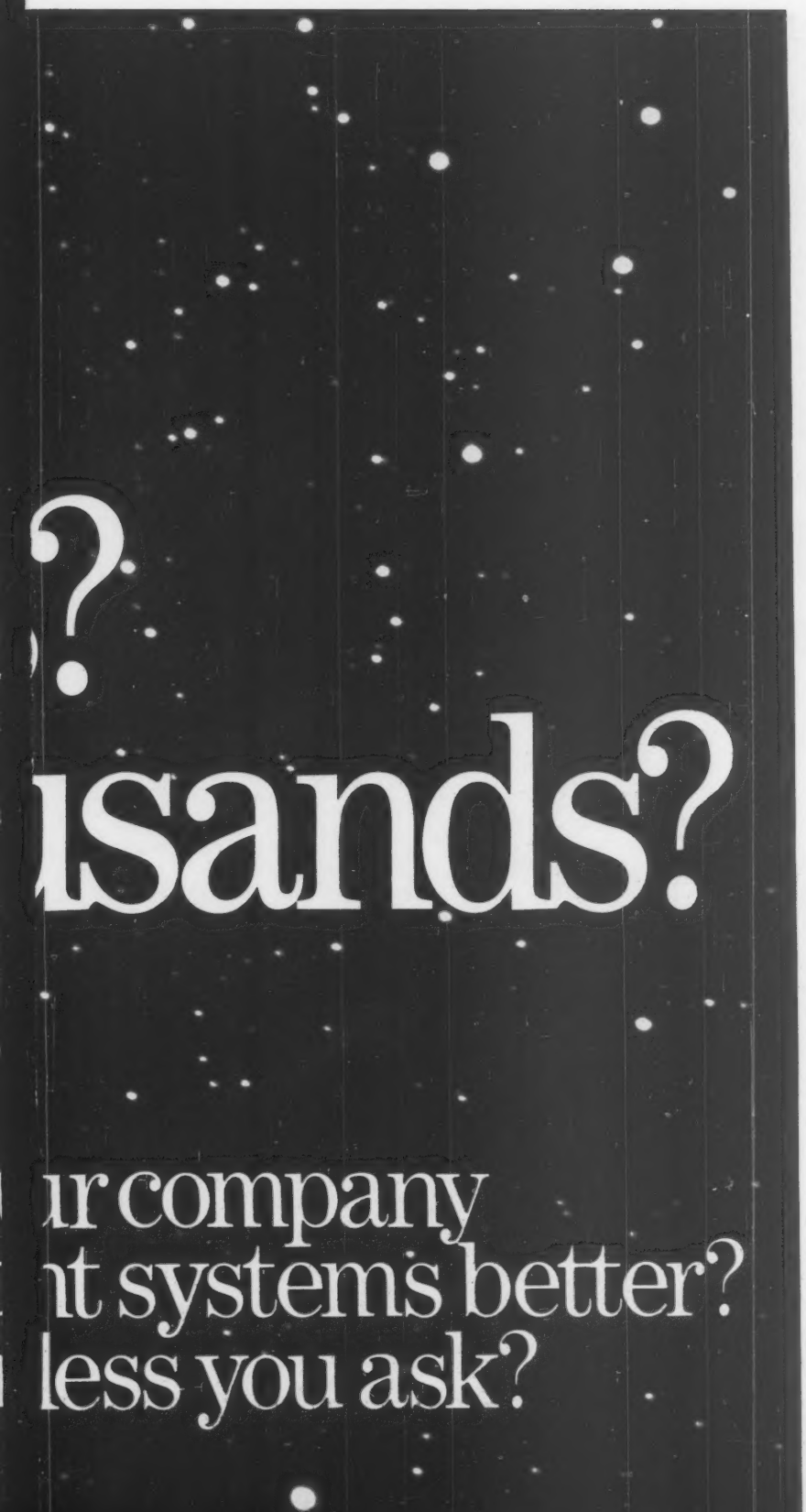

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Motorola to provide remote E-mail

BY ELLIS BOOKER
CW STAFF

BOYNTON BEACH, Fla. — Motorola, Inc. is expected to unveil a nationwide service later this month that lets laptop and palmtop computer users receive electronic-mail messages by way of radio frequency.

Embarc Communication Services, a unit of Motorola's Paging Division, is scheduled to be announced at the Unicom '91 show in Washington, D.C., Nov. 11-14.

The service will have initial coverage in 70 U.S. markets when it becomes commercially available in December, according to Steve Brendle, vice president and general manager of Embarc. He added that Embarc would cost "an order of magnitude" less than Ardis, a nationwide radio-frequency packet data network launched earlier this year by Motorola and IBM.

Technical differences

Ardis and Embarc differ in several technical respects. Whereas Ardis permits interactive, real-time sessions with a host computer, Embarc is a receive-only technology and uses a store-and-forward E-mail scheme. To reach an Embarc user, the sender selects either a 15-minute, one-hour, three-hour or overnight-delivery option. The quicker the delivery, the higher the cost.

Messages are sent through one of Motorola's Embarc switches, transferred to a satellite uplink, bounced from a satellite to one or more regional transmission sites and rebroadcast to the appropriate receiver.

The Embarc E-mail service requires Motorola's Newsstream one-way radio frequency modem. The Newsstream modem connects to personal computers, laptops or palmtops over a standard RS-232 serial cable.

Subscribers can receive up to 56 E-mail messages at once, or about 32K bytes of data through the receiver, which is about the size of a standard pocket pager and can store incoming messages even if the recipient's PC is turned off. Battery life is 1,000 hours on a single AA cell.

Embarc is currently negotiating with a number of information services providers to bring up-to-the-minute news, sports, weather and other information to Embarc subscribers. Pricing details were not available, but Brendle said the service portion will involve a monthly fee and a per-message fee.

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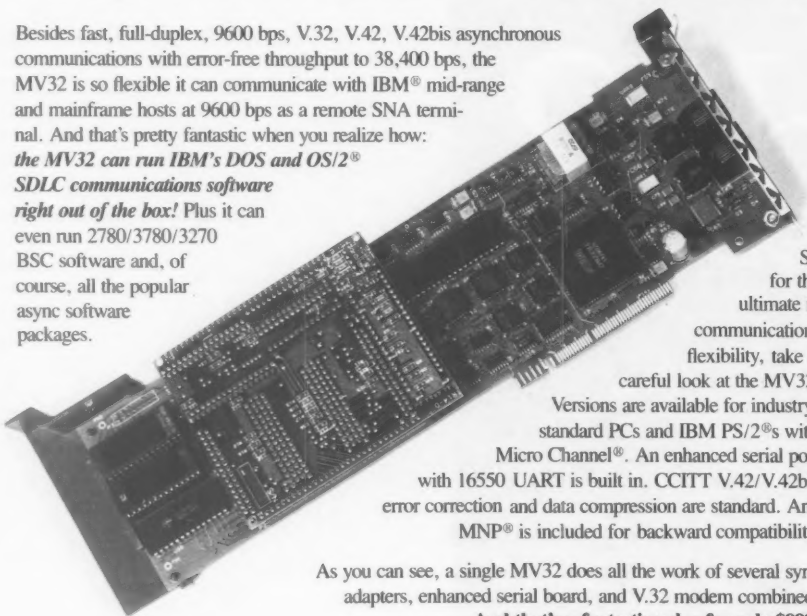

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AT&T moves to reorganize services group

BY ELISABETH HORWITT
CW STAFF

NEW YORK — As part of its drive to grab a bigger piece of the global network services market, AT&T began knocking down organizational walls between the international and domestic arms of its Communications Services Group last week.

By reorganizing, AT&T is responding to customers who have been increasingly clamoring for end-to-end international service and are looking to the company to set up the links, a company spokesman said. AT&T plans to announce new offerings in this area, he added.

The restructuring will merge AT&T's International Communications Services unit into its Consumer Communications and Business Communications units. Each unit will then be responsible for providing both domestic and global services to its customers, the company said.

Together, the units handle all of AT&T's global network services, including switched and private lines and Easylink electronic-mail services. Also under the organization's umbrella is AT&T Istel, the UK-based value-added network subsidiary.

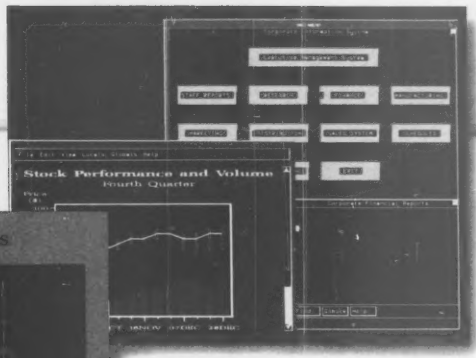
The reorganization moves in the opposite direction of British Telecommunications PLC, which recently created a separate business unit, Syncordia, to meet customers' global network service needs.

AT&T's latest reorganization since 1989 is almost guaranteed to increase operational efficiency and cut costs, according to John Bain, a senior vice president at St. Petersburg, Fla., investment company Raymond James & Associates.

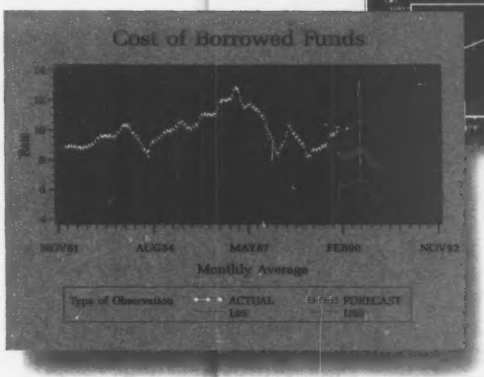
"More important [than implementing a new structure] is just the act of looking" afresh at the way the company is handling its global network business, he added. "They will find some ways of doing things that are no longer appropriate, and they are showing that they care about this area."

Indeed, calls across international boundaries account for about 18% of AT&T's telecommunications revenue and are growing in volume at a rate of 20% per year — or twice as fast as the carrier's domestic revenue, Bain said.

Executive



Finance



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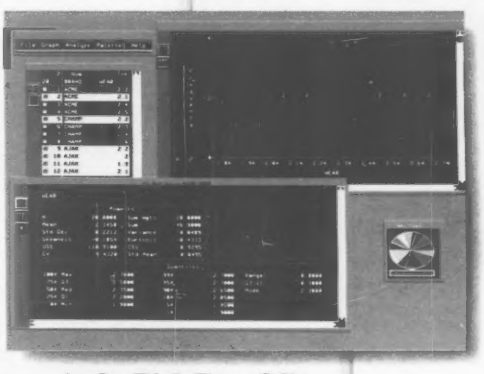

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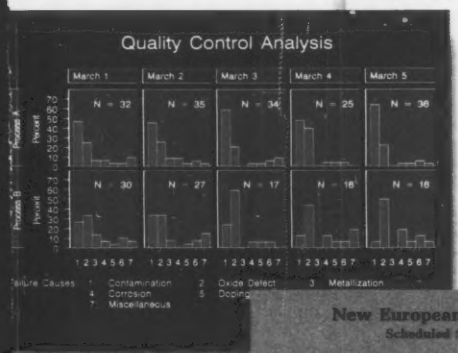

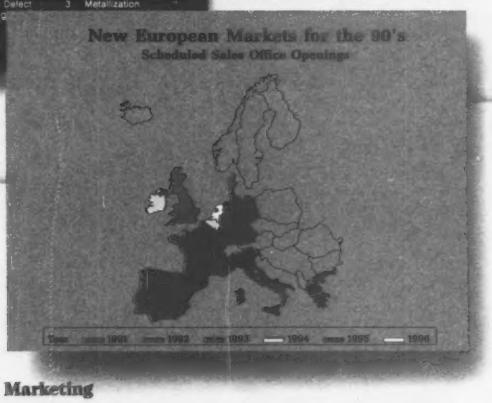

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TECH TALK

Connected by light

■ Honeywell, Inc. and Intel Corp.'s Supercomputer Systems Division will jointly develop a fiber-optic mesh extender (FOME) optical interconnect for massively parallel supercomputers. The FOME will expand the overall computing capability of systems developed under Intel's Touchstone program by connecting several supercomputers to form a single large mesh. The optical interconnect will enhance scalability and demonstrate the practicality of implementing a teraop computer as part of Intel's advanced supercomputer systems development, the company said.

Safe highway studies

■ Battelle, the research laboratory, has won a contract from the U.S. Department of Transportation (DOT) to evaluate futuristic collison warning and vehicle control devices that may one day be used to reduce the number of highway automobile crashes. The research seeks to improve highway safety with technology based on the Intelligent Vehicle-Highway System, a DOT development program. Battelle will analyze crash problems and determine how electronic vehicle control systems and other technology can be used to help avoid crashes.

Weather supercomputer

■ The Swedish Military Weather Service and the Swedish Meteorological and Hydrological Institute have ordered a Convex Computer Corp. C3840 supercomputer for weather forecast modeling, according to Convex. The supercomputer will be used to run one of the most advanced meteorological models available, called the High Resolution Limited Area Model application. The application enables meteorologists to calculate short-range forecasts more accurately and with greater detail because it allows them to factor in terrain variations and other geographical characteristics.

Simulating the turbulent sun

Supercomputers do 'horrendously complex' computations to model the sun's surface

BY ELLIS BOOKER
CW STAFF

At first glance, the chaotically churning yellow mass that appears on the workstation's monitor seems to be little more than a modern-day replication of the globs inside the lava lamps that were popular in the 1960s. In fact, the pictures are simulations of the fiery fluid that makes up the sun's "convection zone," where the superheated material generated inside the sun's 10-million-degree core mixes with cooler material near the surface, according to astrophysicists.

Researchers at the University of Chicago were able to create a simulation of the sun's surface — one that is remarkably similar to the images that astronomers see in their telescopes — by running a 6,000-line Fortran program for hundreds of hours on a Cray Research, Inc. supercomputer.

Although the differential equations describing solar physics "are conceptually simple and have been around for 100 years . . . the solutions are horrendously complex," said Fausto Cattaneo, who along with Andrea Malagoli wrote the sun-modeling computer program.

> EVEN WITH THE Cray Y-MP, the University of Chicago computer model is but a microcosm 100 million times smaller than the real sun.

It is important to note that "simulation" is the operative word here, however. Researchers on this project are concerned that their version of the sun may not hold up as its scale is enlarged.

"We're working with a fluid more complex than water but not as complex as the real sun," acknowledged Robert Rosner, a professor in astronomy and astrophysics at the University of Chicago.

Even with a Cray Y-MP supercomputer at the National Aeronautics and Space Administration's Ames research laboratory to work on solving these equations, the University of Chicago computer model is but a microcosm 100 million times smaller than the real sun.

This difference of scale is significant. As Rosner explained, the sun's convection zone, where friction and motion cause turbulence, is "just like a pot of boiling water." However, the comparison of the whirling motion in a pot to the fiery whirls on the Sun is quite a stretch.

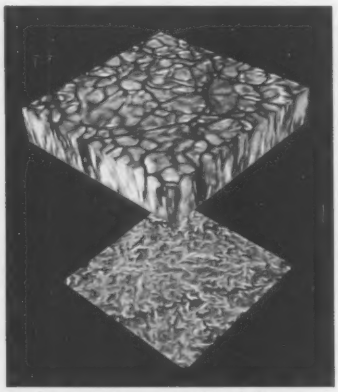
"The question is, are we certain there aren't new phenomena, given this difference of scale?" Rosner asked.

To answer that, the team will scale up its model, using approximations of small-scale motions to calculate large ones, until they can represent motions over several thousand kilometers.

"Understanding comes from modeling simple things and making them gradually more complex," Rosner noted.

Meanwhile, the team is being aided by advances in supercomputer and workstation technology, which have in the past three or four years made it possible to visualize the vast amounts of data generated by the Fortran program.

Particularly important have been powerful reduced instruction set computing workstations — the team uses Sun Microsystems, Inc. Sparcstations — for displaying three-dimensional images. Most of the postprocessing that results in the 3-D images is done on the Cray at the Ames laboratory.



A Cray supercomputer *helps create simulations of the sun's fiery surface*

"For the longest time, you couldn't do more than 2-D," Cattaneo noted, adding that for a study of turbulence, "the difference between 2-D and 3-D is critical."

The Cray supercomputers that the team uses can plot on the order of hundreds of points in each dimension, compared with tens of points in each direction with earlier technology.

The added computer horsepower is needed because the model must simulate both the velocity of larger swirls and the velocity of small swirls inside the larger swirls.

Along with the University of Chicago project, other research teams are currently working on similar computerized simulations of the sun at Yale University, the University of Colorado and throughout Europe.

Intrusion detection system pinpoints patterns

BY MICHAEL ALEXANDER
CW STAFF

When a thief is out to commit burglary, chances are he will first test a doorknob to determine if a door is locked before trying to jimmy it open. Some computer researchers now hope to be able use the rattling of a doorknob — in this case, an attempt to crack computer passwords — to alert them when an outlaw hacker comes calling.

A single doorknob rattle reveals little about an attempted break-in, but a pattern of rattles, at certain sites or key intervals, could provide clues about an intruder's motives.

The researchers are working on a distributed intrusion detection system, or DIDS, that would help pinpoint attempted invasions occurring on computer networks.

Not all intrusion techniques are as simple as rattling doorknobs. DIDS aims to be able to detect even more subtle forms of attack when it is completed in 1992, said Ira Morrison, a member of the University of California Lawrence Livermore National Laboratory's computer and communications security group's research section.

Most work in this area is directed at detecting intrusions into single computers, said Chuck Cole, who heads the computer and communications security group at the Livermore laboratory. The DIDS project also employs researchers from the University of California at Davis, the U.S. Air Force and Haystack Laboratories, a private company.

DIDS monitors traffic between network computers in a protected segment of the network and could thus form a big picture of network activity, Cole said. A typical protected segment might consist of all computers at one site.

Once an intrusion attempt is detected, DIDS will preserve information about the attempt to help security officers determine the exact nature of the attack, the extent of damage and how to counter the threat.

The data collected may also help pinpoint the location of the attacker and may be used as evidence in prosecution, Cole said.

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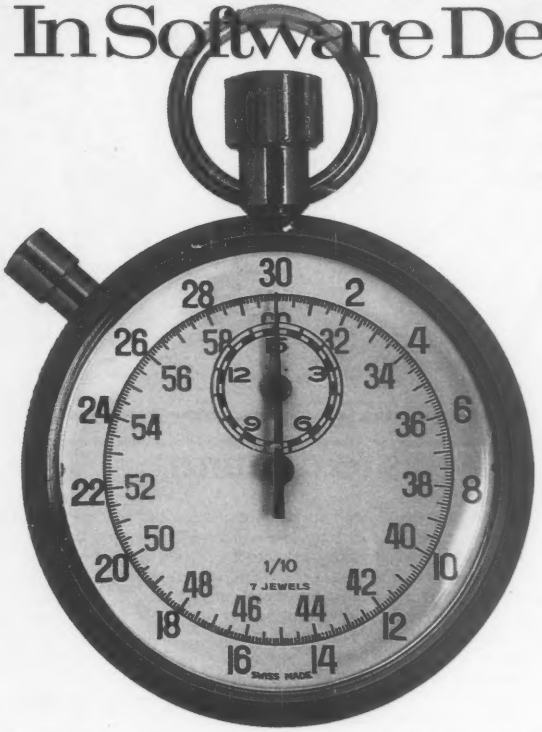

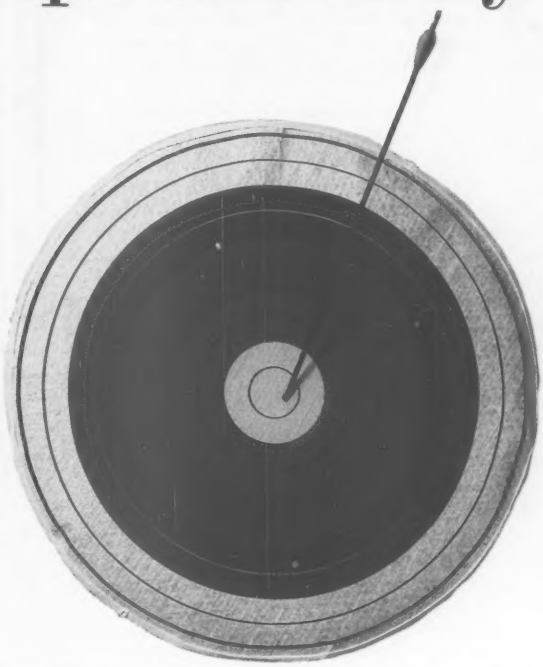

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EDITORIAL

Mistaken identity

Just about everyone remembers that famous line uttered by Paul Newman in the movie *Cool Hand Luke* when, in trying to explain the confusion around him, Newman as Luke says, "What we've got here is a failure to communicate."

The recent annual meeting of the Society of Information Management added its own twist to that distinctly American aphorism.

No fewer than three men approached *Computerworld*'s IS director (who was there as a SIM member and attendee, her name tag so designating) and asked her how she was enjoying her spouse's program.

An honest mistake, you might say. After all, she's a woman, she's relatively young, and she's present at a meeting where you could probably count the number of female attendees on one of your fingers without seriously affecting your typing speed.

People attend these big conferences ostensibly to learn the tricks of the trade from what they consistently cite as the premier source of trusted information — their peers. And had anyone bothered to question our relatively young, female IS director, they might have learned quite a bit.

For example, they would have discovered that she is spearheading a major systems conversion here, one that will remove our aging minicomputer-to-terminal, proprietary environment and replace it with a workstation-based, client/server architecture that exploits the more open Unix environment. She's already gone through a year-long planning process of writing system specs and selecting the vendors.

What's more, this systems overhaul will have to take place without disrupting a production environment that has produced a weekly newspaper every week for the past 24 years. In other words, this conversion had better go smoothly. Doesn't this sound just like the kinds of touchy conversions that are going on in departments all over corporate America? And if it's going to happen at your site, wouldn't you like to hear a firsthand experience from someone who's already suffered some of the pain?

Unfortunately, this benefit was lost on some of the attendees, who instead saw just another young woman who, presumably, was just tagging along with her husband.

The point here is not to tar and feather SIM, its meeting or its membership. But look around and you'll see things are changing. By the year 2000, half the work force will be women or minorities. Will they be accepted as valid peers?

Organizations such as SIM will do well to remember the lessons learned by Adapso, the software industry organization. Their founding fathers, mostly from the mainframe world, shut the door on PC vendors in the 1980s. So the PC vendors went off and formed their own group: the Software Publishers Association, which today is arguably the premier software industry group.

In other words, groups such as SIM need to actively reach out to the young, rising stars of IS or risk mortgaging their own future.

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LETTERS TO THE EDITOR

Clarifications

Your article "Persian perks" [CW, Sept. 30] contains a factual error and one omission.

The factual error is in the statement, "Up to $70,000 is free of both income and Social Security taxes." Earned income by U.S. citizens, no matter where that income is earned or who pays the person the income, is fully subject to U.S. Social Security taxation.

In addition to having to pay the employee's share of this tax, under some circumstances, the worker may be liable for the employer's share as well. Furthermore, most Gulf states have a social security system of their own in which workers are required to make payment, regardless of citizenship or expectation of ever being eligible for benefits.

The omission regards insurance. Unless the worker is a national of the country in which he works, the employer usually pays the full cost of health insurance through a company in the worker's homeland. The problem arises in that most Middle Eastern economies are cash only, and health insurance is not a common practice. The employee must, therefore, be prepared to make the payment and file the insurance claims on his own and be reimbursed.

Geoffrey K. Wascher
Plymouth, Mich.

Learn a lesson

The recent refusal without comment by the U.S. Supreme Court to hear Robert Morris' appeal [CW, Oct. 14] provides a clear message to electronic intruders — whether they be hackers or "otherwise law-abiding computer users . . . with the intention of merely looking around" — that electronic breaking and entering is a crime. Period.

It is ironic that the Executive Report on "The Ethics Gap" appears in the same issue as the news about the denial of Morris' appeal. Maybe Morris and others who think that computer crime legislation will "inhibit the creative uses of computer technology" should read Donn Parker's guidelines for ethical action, especially: "If an act or failure to act is not right for everyone to commit, then it is not right for anyone to commit."

Norbert J. Kubilus
Vice president & director, MIS
BCM Engineers, Inc.
Plymouth Meeting, Pa.

Wasted money?

Your article "Paid research not key to IS plans" [CW, Oct. 21] did an excellent job of reporting what information systems executives say, and indeed what they believe, about their reliance on industry analysts and research firms. Unfortunately, it stopped short of discovering why they believe what they do.

Top IS executives know that they are being paid to make technology choices. To admit that research firms' opinions shape their decisions is to admit an inability to make these decisions independently. Executives cannot bring themselves to do this: It is simply too damaging to their self-image.

The easiest way for them to reconcile the conflicting facts is to persuade themselves that analysts' opinions are less important than they actually are.

Users pay, to use your own figures, $10 million to $90 million per year for their opinions. Would you pay that much for the same sort of information, year in and year out, if you didn't really use it?

Efrem G. Mallach
Efrem G. Mallach Associates
Needham, Mass.

Banyan backer

In regards to "LAN rivals seek parity with Novell" [CW, Oct. 14], I believe you have done an injustice by misleading your reader with the misconception that market share equates to technological superiority.

This article serves to discredit those perceptive IS managers who years ago recognized that the as-yet-unmatched technological superiority of Banyan Systems, Inc.'s Vines would permit "MIS-managed" evolution of the personal computer local-area network phenomenon.

Banyan preceded Novell by more than a year in delivering a 386-based network operating system. Banyan has also provided technological superiority in first delivering symmetrical processing to provide the advantages of multiple processors within a file server.

Richard Stephens
Vice president, MIS
UST, Inc.
Greenwich, Conn.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Don't mess with what isn't yours

Simple advice, but a message that the leasing industry needs to heed

SAM ALBERT

I've been following the gyrations of the IBM and IBM Credit Corp. (ICC) suit in Delaware against Comdisco with more than passing interest. Even before the latest development, the federal suit filed by IBM (this time without ICC) in Chicago on Oct. 24, a piece of unsolicited advice my father gave me as a young man kept popping into my head. "Son," he said, "never mess with someone else's property without permission, even if you think you're doing him a favor."

The memory of those words first cropped up as I read a Comdisco advertisement that offered readers a sky-is-falling "white paper." That white paper explained how the original lawsuit threatens computer users' access to economical alternatives in an open, competitive environment.

There was a lot in that document about parts and subleasing, which provided the background to begin to understand IBM's new claim about "counterfeit" parts. Comdisco based much of its somewhat self-serving argument on so-called "freedom of movement" of machines and parts . . . even if the machines and stripped parts don't belong to Comdisco.

Without getting into the legalities yet to be decided in court (or by settlement), I was struck by Comdisco's use of some pretty fancy buzzwords, such as "fungibility," "freedom of movement," "robust secondary market," "like-for-like substitution" and so forth in an attempt to justify exactly what my father had warned me against.

Getting to the point

Cutting through all the claims, accusations, responses, press releases and so-called "white papers," what Comdisco is saying is that it's OK for them or any other dealer to take a sublet machine belonging to IBM, pull out and replace parts, sell or otherwise dispose of those parts, as long as IBM gets a machine back with "equivalent" stuff in it at the end of the lease term.

IBM's first lawsuit said that "equivalent" doesn't make it. The October filing said worse — "You're passing off as equivalent what's really counterfeit."

Although Comdisco claims the right to fiddle with IBM's sublet machines, there can't be much question about who really owns the equipment. The ICC term lease master agreement (TLMA) clearly says that ". . . the equipment under lease is and shall be the property of lessor." IBM isn't about to give up that right.

IBM has stated that subleasing is a vital, necessary activity and makes provision for it in its TLMA, which says, "Upon lessor's prior written consent, which shall not be unreasonably withheld, lessee may sublet the equipment or relocate." But what it doesn't expect or countenance is having its assets disappear outside the U.S., be sold off or be torn asunder with some vague promise that somehow they will reappear magically at the end of the term, all spruced up and ready to go to the next customer. And, as the more recent lawsuit makes clear, it certainly isn't about to sit still if its assets start to appear, reconfigured with memory boards that it didn't manufacture.

The subject of fungibility or interchangeability of parts is a troubling one. Comdisco says substituting like-for-like parts is OK and a widespread practice in the leasing industry. Moreover, nobody gets hurt.

IBM says it isn't OK, citing real and potential problems involving quality, personal property, sales and use tax liability, asset accounting and clear title.

Small price to pay

I'm sure the notion that it could end up competing for upgrade business against a memory module that was taken from a machine it still owns has rankled IBM. That's a small annoyance, however, compared with having to compete with products that were made by a competitor but are being passed off as "genuine" IBM, which is what the new suit alleges.

It seems to me that the original lessor — in this case IBM — has every right to prevent the lessee and others from doing things to its machines it does not want done, or doing things to the machines that infringe on the product's trademark.

If I lease you a Ferrari Testarossa, I would expect you to maintain it properly. And, while I'd expect some wear and tear, I wouldn't want you to ship it off to Brazil or sell the engine to someone in Malaysia. And I wouldn't want you to return the auto to me with another used Ferrari engine under the hood, let alone a Subaru engine or a "no-name" one that you've assembled from various parts and call a Ferrari engine.

As the original lessor and owner, I wouldn't want to — and shouldn't have to — make distinctions between imprecise terms such as "equivalent," "like-for-like," "same, but different," "comparable" and so forth.

This is something all participants in the leasing industry must sort out. Upgrading and reconfiguring of computer equipment is a necessary, fundamental and a normal part of leasing activity. However, if there's cavalier disregard for the rights of the owners of leased property, the credibility of the whole industry will suffer.

Albert is president of Sam Albert Associates, a management consulting firm in Scarsdale, N.Y.

What, exactly, do you mean by 'downsizing'?

RICK MARSHALL

My boss called me into his office the other day, saying he had something very important to discuss with me. "I want to talk to you about downsizing," he explained. "Ever heard of it?"

I nodded. Sure I'd heard of downsizing. Who hasn't? Any respectable trade rag has done something on it in the past year. I started to tell him about the interesting article I'd read that very morning when he cut me off.

"I'm glad you're aware of it, and we don't have to get into the details now. But I need you to tell me when we can do it."

He was obviously nervous about the whole thing. He was looking at me expectantly, as if I could come up with a date standing right there in his office. Surely he understood that an IS professional never, ever replied with a date the first time he was asked.

Only after careful analysis and painstaking examination of the alternatives could someone come up with a date. And, even then, the data provided was not a guarantee. I often have to forgive him in that respect because he does not truly have an IS background. He was, at one time, a user, and he sometimes regresses to taking the user's devil-may-care, shoot-from-the-hip attitude.

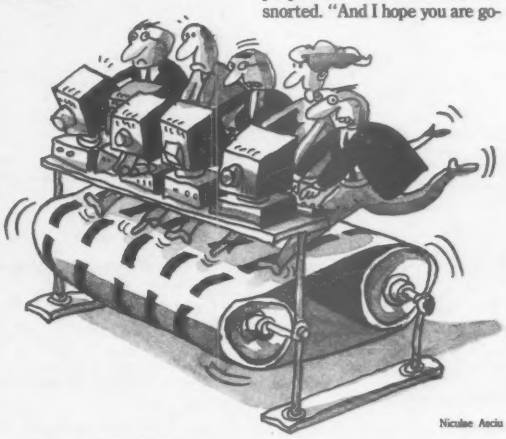
I told him I would think about it and let him know how soon it could happen. In my mind was a swirl of thoughts as I considered the issues. The biggest thing that kept coming around was the cost. The way my boss talked, it didn't sound like he cared about cost. He seemed eager to pursue plans on the spot, regardless of the pocketbook implications.

This was unusual for him. True, his old "user" personality didn't concern itself with cost. When he was a user he found new ways to apply the term liquid to corporate cash. (That's not to say it *all* went down the drain.) But his IS self attacked cost with the zeal of a missionary on safari. I've seen molasses move faster than his expense approval signature. I stopped to consider what could be driving this change.

Softening the blow

"Boss," I said, trying to soften the blow, "do you know about the dollars involved?" There's always a special shudder that occurs when you suggest you may have to spend money. It's not pretty, so I try to avoid it whenever I can. This time he didn't shudder, though. He smiled.

"I know," he shot back. "It's great, isn't it? I've always said smaller is better. We could end up saving big, big, big by thinking small, small, small." He swept his hands apart to signify the big and then drew them close until the fingers touched to show the small.



Nicolae Asciu

At this point I started to worry. Was I having a close encounter with an alien impersonating my boss? I looked around to see if anything was blocking my exit from his office and formed a mental picture of where the fire alarm was down the hall, just in case. I was pretty sure I could still outrun him, if he didn't have some sort of stun beam. But, before I panicked, I asked a few more questions.

"Well, small is certainly good, but what about the dollars we'd have to spend to bring the smaller stuff in?" I queried. He blinked and looked confused.

"We don't have to get smaller people when we downsize," he snorted. "And I hope you are going to treat this seriously," he added in an authoritative voice. His eyes narrowed into a glare and instantly I knew it was definitely my boss. Not even an alien could imitate his patented "stern look."

"No, what I mean, Boss," I continued, "is that the equipment to downsize is going to cost big money. Sure it'll pay off in reducing our mainframe use in the long run . . ." I studied his face as I spoke, and he looked utterly confused.

"What in the world are you talking about?" he asked, shaking his head.

"Downsizing," I answered. "You know, bringing applications down to smaller platforms. PCs, et cetera." A look of understanding came over him.

"Smaller platforms!" he blurted out. "I meant downsizing our staff. You know, getting rid of people and making do with fewer."

Now it was my turn to look like I understood. And I did.

"That's what I meant, too, Boss," I answered without missing a beat. "I only meant that the equipment costs are big money, and we'll be spending less of it with fewer people. I'll get right on it."

I started backing out of his office, not really wanting to explain any further. I could see the doubt lingering on his face, but I turned and quickly headed back to my desk.

It was almost quitting time, so I packed it in before he could figure out exactly what I was talking about and come looking for me. Soon afterward, I threw open the door to my house and was greeted by my wife.

"Honey," she said. " I think it's time we downsized. We're going on a diet . . ."

Marshall is director of information services at Ameritech Publishing, Inc. in Troy, Mich.

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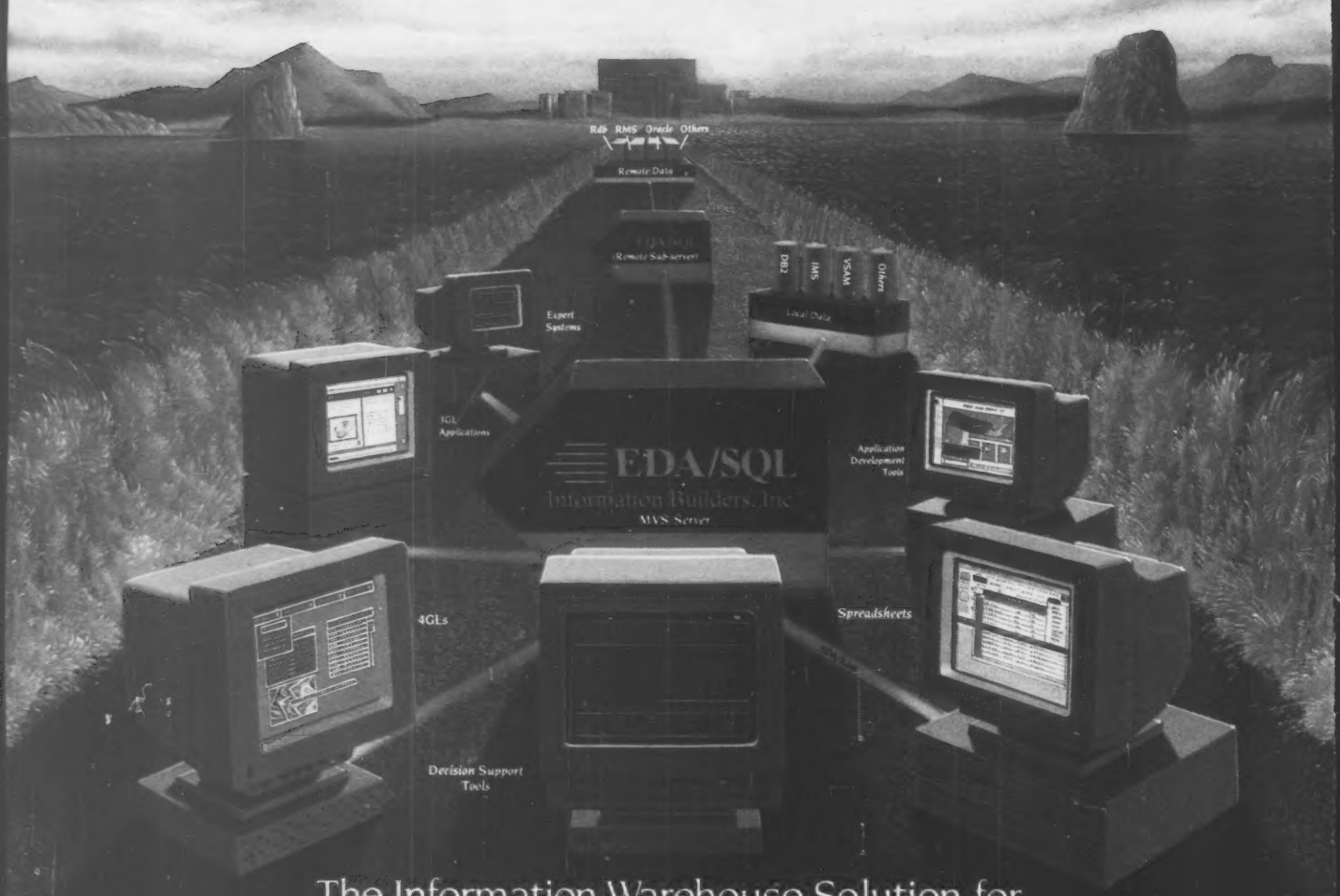

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SOFTWARE SHORTS

A CASE bill of $5B

Users spent $5 billion on computer-aided software engineering (CASE) tools last year, and that total will more than double to $12 million within the next four years, said market researcher **Dataquest, Inc.** Nine vendors, including **IBM, Digital Equipment Corp.** and **Computer Associates International, Inc.**, topped the $100 million sales mark for CASE tools in 1990.

Goal Systems International, Inc., based in Columbus, Ohio, and **Filetek, Inc.**, based in Rockville, Md., recently entered a development and marketing alliance. The agreement calls for the development of support interfaces between Goal's automated output management software product, Sysout Archival and Retrieval, and the Filetek Storage Machine.

Progress Software Corp. in Burlington, Mass., maker of the Progress fourth-generation language and database management system, has signed an agreement with **Micro Decisionware, Inc.**, a database tool vendor based in Boulder, Colo. The contract calls for Micro Decisionware to assist Progress Software in developing the Progress Connection to Micro Decisionware's Gateway to DB2.

Users await Unix version of Wang DBMS

BY SALLY CUSACK
CW STAFF

The major challenge Wang Laboratories, Inc. faces during the next year is getting a Unix-based version of its Pace database software out the door, according to the leader of a Pace users group.

Ramsey Miller, chairman of the Americas Pace Special Interest Group, said in a recent interview, "Most of us are very relieved that Pace is going open. The only reason I have stayed with Wang is because of the database."

Pace operates in Wang's proprietary VS midrange computing environment. However, Wang has announced it will migrate the database management system to the IBM AIX-based RISC System/6000 platform, with the goal of helping users retain their applications while moving toward a more open environment. According to Miller, a government information systems worker in Canada, there are more than 6,000 Pace licenses worldwide and probably four to five programmers using each license.

Continued on page 33

Change of Pace

Wang Laboratories' Pace

- **Introduced in October 1983 as an integrated application development and relational database package for the VS line of midrange computers.**
- **Currently more than 6,000 licenses worldwide. At least half of these users are based in the U.S.**
- **Wang users need Unix-based Pace to move their existing mission-critical database applications into the open systems environment.**
- **Wang is committed to delivering a version of Pace for the IBM RS/6000 environment by June 1992, with other Unix-based versions to be delivered after that.**

CW Chart: Michael Siggins

Lotus eyes client/server route to boost 1-2-3/M

BY PATRICIA KEEFE
CW STAFF

At first glance, it appears that 1-2-3/M, Lotus Development Corp.'s spreadsheet for various IBM mainframe environments, may not have much of a future. But a closer look reveals a client/server detour in the future for the roughly 18-month-old package. Without it, even Lotus might admit that 1-2-3/M risks finding itself relegated to a computer museum.

Lotus acknowledged that 1-2-3/M does not have a large following. The total installed base for mainframe spreadsheets, according to La Jolla, Calif., market researchers Computer Intelligence/Infocorp, is only 1,500 to 1,600, out of which Lotus is claiming a 15% share. Lotus was "surprised and a little chagrined" to find that the primarily leased 1-2-3/M is mostly used as a 3270 terminal-based spreadsheet.

"You won't see the mainframe used as a spreadsheet engine until Lotus and the users have fully implemented the networks and distributed application architecture that positions the mainframe as an intelligent back end to the PC spreadsheet," said John Dunkle, a consultant at Workgroup Technologies, Inc. in Hampton, N.H.

Ominous trends

Even if the terminal-access slice of the pie increases, there are more ominous issues lurking. Lotus said it sees a trend at traditional mainframe sites to move terminal users onto personal computers, thereby eating away at what admittedly is already a small market opportunity.

Despite these clouds on the horizon, the mainframe team at Lotus remains upbeat. Tony Walsh, 1-2-3/M product manager, and Jim Burnam, Lotus' product line manager for Network Application Products, said they expect that the recent expansion of 1-2-3/M to support newer versions of 1-2-3 — as well as a broader range of IBM operating environments, such as VM/VSE — will also help "arrest the decline."

In addition, the fact that 1-2-3/M works with PC- and workstation-based versions of 1-2-3, regardless of the operating system choice, is helping Lotus to place 1-2-3/M today, according to Walsh.

"If companies know they are going to restandardize on thousands of PCs over the next two to 10 years, Lotus can provide them with a migration path, even if they don't know where they are going," Walsh said, claiming that many of his competitors do not currently have desktop versions of their mainframe spreadsheets.

Dunkle is skeptical. Noting the number of existing main-

Continued on page 37

Waiting in the wings

While Lotus replots the future of 1-2-3/M, it is working to address some existing problems:

- Batch processing. Absent from the first release of 1-2-3/M, it will be added to forthcoming releases announced the week of Oct. 14 [CW, Oct. 14]. A nonissue for users operating in 3270 mode, batch processing becomes more critical as users move into a LAN- or work group-supported environment.
- Improving the interface for terminal users. Now 1-2-3/M can act as a slave to PC spreadsheet clients.
- Security. Still to be corrected is a security hole that forces reluctant IS managers to open up all of their mainframe files to possible erasure by meandering users. Lotus has a workaround as a fix, which requires some Assembler coding work on the part of the user.

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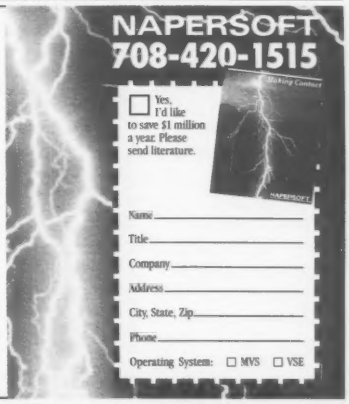

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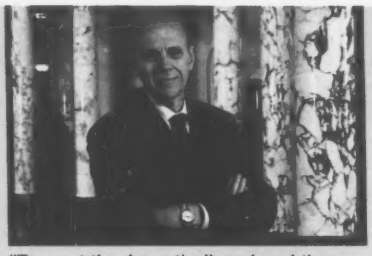

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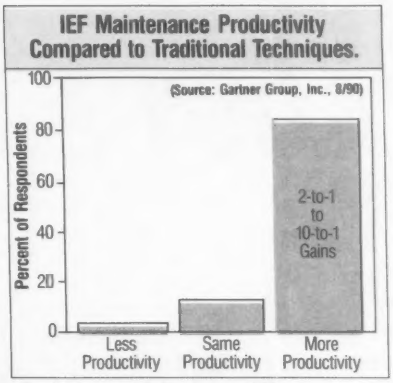
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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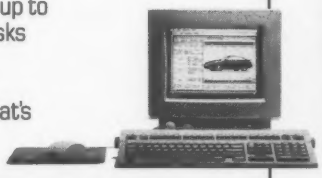

So what went wrong? Why hasn't office productivity kept pace with technology? What's the missing link?

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Considering concurrent engineering

Four industry experts take on this hot topic as participants in a recent roundtable discussion

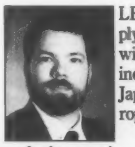
Along with total quality and just-in-time production, concurrent engineering is a hot concept among manufacturers — part of the endless search for speed and efficiency.

But have manufacturers begun deploying systems that permit designers, engineers, factory managers and others to work together in tight collaboration?

What technical and organizational obstacles to concurrent engineering remain?

Computerworld*'s Ellis Booker recently spoke with four experts attending the Auto-Tech '91 conference in Detroit about the state of concurrent engineering. The participants were Henry Veldman, associate director of the Automotive Industry Action Group (AIAG); Theresa A. Williams, vice president of BTW, Inc., an engineering consultancy; Rick Yotti, director of the Technical Computing Group at Allied-Signal, Inc.'s Automotive Technical Center; John B. Lewis, engineering manager at Plumley Cos.*

YOTTI: Computer-aided design (CAD) started as computer-aided drafting, then became a design tool. Now the idea is to shorten design cycles . . . by concurrent engineering between supplier and manufacturer.



LEWIS: We supply the worldwide automotive industry — U.S., Japanese and European.

The Big 3 make it a requirement, to make a quality rating, for Tier 1 suppliers to have these technologies. By far, the American automakers are ahead [with these technologies].

VELDMAN: The problem is when suppliers are required to deploy systems that are incompatible. More than likely, [a supplier] will have to have three systems. This is difficult for the supplier and very expensive. So the only avenue is to pass [the cost] on to the customer.

AIAG has a number of activities to address data exchange, specifically data translation. We are in the definition stage of an automotive protocol. It's auspicious work for AIAG and is supported by its member companies, both suppliers and manufacturers.

YOTTI: I'd concur the U.S. auto industry is more advanced than Europe's or Japan's.

However, at the same time, we do have many American standards . . . We have a global industry that is working on national standards. We are fortunate that American standards were first.

Concurrent engineering is an organizational issue. The tools — high-speed networks, protocols, powerful workstations — have been around for a few years.

LEWIS: Our customers' requirements have changed considerably in the past six years. Now, we're working strictly on the computers. The customer gives us a geometry, we design a part, and [the customer] incorporates this into the model. That's changed the nature of our business.

WILLIAMS: Take [General Motors'] C4 Corporate Data Pipeline, their means to achieve these goals. [GM will have] one common data pipeline.

The problem is, the underlying business processes have *not* changed.

YOTTI: In general, less money is spent on technical computing than on commercial computing. Over the last nine years at Allied, we're seeing, at best, level funding. This is thanks to increased function and capabilities [of the equipment] and thanks to advances of the computer industry in general.

WILLIAMS: What I've seen is that it's all tied to the car sales volume. They still have to manage a business, so no matter how good the technology and the tangibles it may give them, it still has to be justified by accounting. And if car sales are sluggish, the deployment slows.

DEC fields VAX performance monitor tool

BY MARYFRAN JOHNSON
CW STAFF

TORONTO — Keeping track of a diverse and decentralized crop of Digital Equipment Corp. VAXs has always been a chore for Bell Canada, which has a bit of everything, from Vaxstation 3100s to the VAX 9000 mainframe.

So when the chance to field-test a new performance monitoring tool called Decperformance Solution (DECPS) came along, Canada's largest phone company signed up.

"We have a wide range of VAX skills, but we're not a dedicated computer shop. We're a telecommunications company," said Paul Grinnell, computing facilities specialist at Bell Canada, a subsidiary of Bell Canada Enterprises, Inc. "DECPS fits in well because it gives our people the ability to work well with a machine without having to acquire the long-term experience of a system manager."

Monitoring the performance of VAX systems has always been an all-or-nothing proposition for users. They had two products to choose from — VAX Performance Advisor (VPA) or Software Performance Monitor (SPM) — at costs ranging from $1,000 to $51,500 per machine license.

Now DEC has merged the two products into Decperformance Solution Version 1.0, unbundling it into separate modules for data collection, performance advisory, capacity planning and accounting chargeback. The split functionality is intended to cut the cost and effort needed to manage system performance and to let customers choose only the tools they need.

New features in Decperformance include a tabular reporting format, better planning capabilities for complex environments and a Decwindows interface for ease of use and graphic presentation.

For Bell Canada, with VAXs spread over 25 to 30 sites in Ontario and Quebec, the ability to install data collectors on several machines while keeping capacity planning and performance advisory modules on one centralized VAX is bound to save money, Grinnell noted.

> MONITORING THE performance of VAX systems has always been an all-or-nothing proposition.

"I don't have to license [products] on every machine," he explained. "This tool gives us the ability to collect the data reliably on the machines we have and then perform our own capacity planning rather than bringing DEC in as part of that process."

DEC spent the past two years combining the functions of the two older performance products. In merging VPA and SPM, however, DEC had to jettison some of the SPM functions to get it to market sooner, said Laura Gawronski Horn, DEC's capacity management marketing manager. Two of the functions lost were the ability to vary time collection intervals on data and to collect extremely detailed CPU use information.

Users of real-time applications will probably be most affected by the loss of those functions, Gawronski Horn said, so DEC is recommending that certain customers keep SPM running alongside the Decperformance modules.

For users with VPA or SPM installed and under service contract, DEC will replace those products with the appropriate Decperformance modules at no additional licensing or service charges. Only new customers will have to pay for the products.

The four integrated components of Decperformance, each separately priced, are as follows:

- The Data Collector, priced from $1,200 to $25,120, for gathering and managing VMS system data on a schedule specified by the user. Collection on each node can be managed from one central location.
- The Performance Advisor, priced from $3,600 to $25,000, for performance analysis on system degradation and recommendations for improving performance.
- The Capacity Planner, priced from $6,200 to $40,820, for determining system performance under varying work loads.
- The Accounting Chargeback, priced from $1,920 to $12,072, which allows systems managers to create reports indicating charges for various system resources.

Brownstone unveils set of repository tools

BY ROSEMARY HAMILTON
CW STAFF

Brownstone Solutions, Inc. released a set of upgraded data dictionary and software development tools last week for customers with repository-based applications development environments.

The Brownstone Data Dictionary/Solutions (DDS) is positioned as an alternative repository for customers who are waiting for IBM's Repository Manager to become more robust. Brownstone has geared its other products to work with IBM's Repository and the AD/Cycle applications development environment. It has also stated that it will migrate its customers to the IBM Repository when they elect to make the move.

The latest version of DDS offers three new facilities that provide more automated procedures for managing data in a repository, said Lewis Stone, a director and founder of Brownstone.

A scripting facility contains steps or procedures a developer may wish to use on certain objects stored in DDS. For example, a user may want to restructure a DB2 table. Previously, the user would need an understanding of the DB2 tables and the steps to complete the restructuring. With the scripting facility, a user can select from a script what restructuring work he wants. He then initiates the job, and the scripting facility performs the necessary steps.

A forms facility allows a user to create different views of information in DDS. It helps developers create one or many views of data for a particular project, Stone said.

A Cobol scanning facility helps automate the task of loading data about Cobol programs into DDS. It scans a program, extracts neccessary data about the program and then inserts it into DDS.

The three facilities are basic components of DDS and will be offered to users as a free upgrade as part of their maintenance contracts, Stone said. A license for the earlier release of DDS was $60,000 for a single mainframe CPU. Pricing for Version 5.0 has not been determined yet, Stone said.

Upgraded reporting

Also last week, Brownstone introduced an upgraded version of its reporting facility and a new IMS scanning facility. These modules will be sold with Brownstone's tools, including the DB2 Admin/Solution and IMS Admin/Solution products.

The reporting facility provides a predefined suite of reports a user can generate. The new version includes up to 40 different kinds of reports.

The IMS scanning facility automates some of the steps required to load data about IMS into DDS, Stone said.

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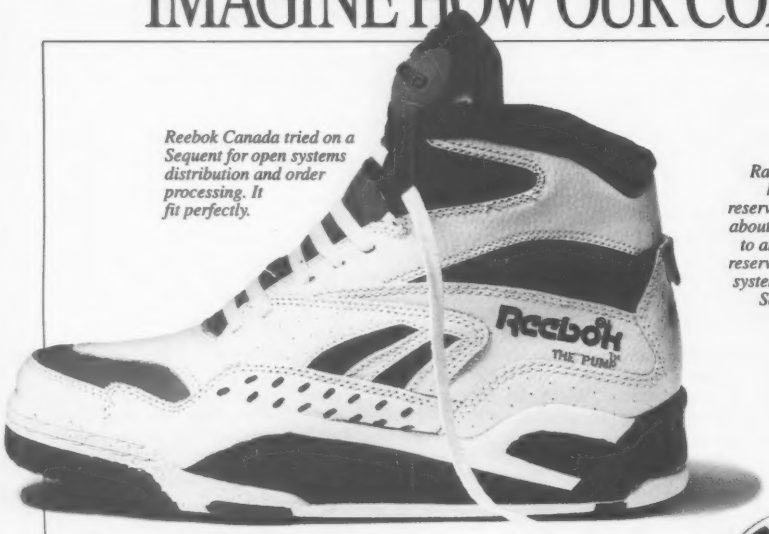

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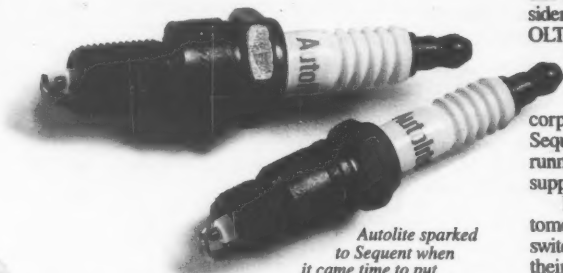

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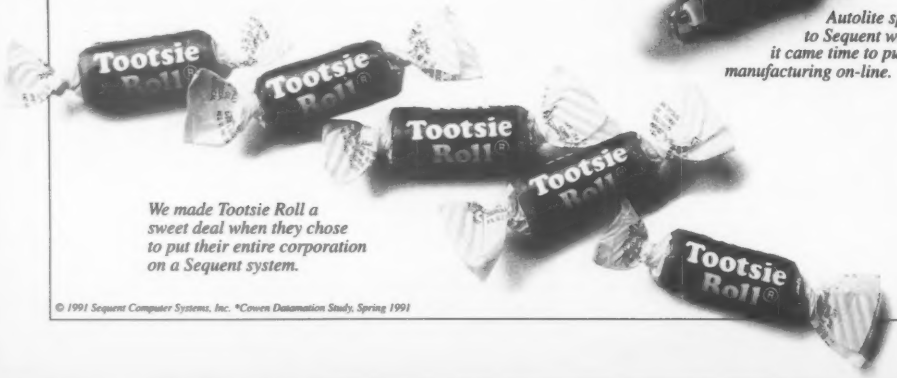

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Wang's straits may slow rush to Mercury

BY SALLY CUSACK
CW STAFF

The high-end system code-named Mercury is expected to be coming out of Wang Laboratories, Inc. in January, bringing with it features such as CMOS technology and greater processing speeds. However, Wang users seem unsure whether they will need such a VS-based system, particularly given Wang's corporate hardships.

Mercury is being designed to provide substantial performance increases compared with existing high-end VS 8480 and VS 10000 boxes.

Incorporating CMOS technology, it offers a cache size of 256K bytes and provides VS 10000 instruction accelerators to improve the performance of floating-point and decimal-packed instructions, according to preliminary details issued by Wang at an October users group meeting.

Bells, whistles and faster performance aside, VS 10000 users may not want Mercury for a variety of reasons.

Jim Burkett, vice president of systems engineering at Berkeley Information Services Co. in Luverne, Mich., uses VS 10000 technology and characterized Mercury as "another good step forward in Wang's VS line.

"However, with Wang's current financial status, further investment in VS architecture might not be a good idea," Burkett added, noting that Berkeley Information has decided that the VS is not the appropriate platform for the company after the next 18 months to two years.

Heavy-duty DP

Berkeley provides technical support and application software for several insurance firms in the Midwest. Most of Berkeley's clients use the Wang VS technology in a heavy-duty data processing capacity.

"Prior to the Wang/IBM alliance, we had evaluated the IBM [Application System/400] and decided that while it is a nice platform, the development tools are not as rich as they are in the VS world," Burkett said.

The company is evaluating several platforms, including the IBM RISC System/6000, as well as systems from Hewlett-Packard Co. and other vendors, Burkett added.

Other VS 10000 users still have some headroom left before making an upgrade or migration decision. Leon Hebert, vice president of services at Norfolk & Dedham Mutual Fire Insurance Co. in Dedham, Mass., said the company is not interested in upgrading at present.

"We have a [VS 10000] Model 50 right now and could upgrade to a 75 or 100 model if necessary," Hebert said.

Frank Gens, a vice president at Technology Investment Strategies Corp. in Framingham, Mass., said that most VS users would like to "sit tight" and see how the open systems world shakes out. And while Wang and IBM present the AS/400 as an option to the VS users in heavy data processing environments, "Wang customers, better than most, know the downside of being tied to a proprietary platform," Gens said.

Users await Unix version of Wang DBMS

CONTINUED FROM PAGE 27

Miller said Pace users are split two ways: Many want to put an open Pace program on the VS machine, while others want to keep the VS and use open Pace on other platforms.

He added that Pace commands user loyalty based on its speed, fourth-generation language, screen generators and data dictionary capabilities.

Ironically for Pace users, a version designed for use with The Santa Cruz Operation's SCO Xenix operating system has been in beta-testing for several months, but users and analysts said it appears that the Wang/IBM alliance has caused release of the SCO port to be delayed.

Wang has proclaimed the RS/6000 reduced instruction set computing-based workstation its "target platform" for future development, and the vendor is tailoring an AIX version of Pace to run on the system.

While no actual delivery date has been set, David I. Goulden, vice president of marketing and development for Wang's Office 2000 systems business, said users could expect the product to ship before June 1992.

Other flavors of Unix/Pace will be delivered after the product debuts on the RS/6000 platform, Goulden added.

Still, Miller said his biggest concern is when the Pace/AIX product is going to hit the street. Other Wang users echoed this sentiment.

Users are concerned with the migration timing issues based on Wang's shaky finances and the industry's rapid shift from proprietary platforms to more open systems.

Hugh V. Naughton, director of information systems at Gas Research Institute in Chicago, has been a Wang user for almost a decade.

The institute has a committee looking at what its long-range computing direction will be, but according to Naughton, no decision has been made.

"We need strong direction from our vendor, and so far, that has not been forthcoming," Naughton said.

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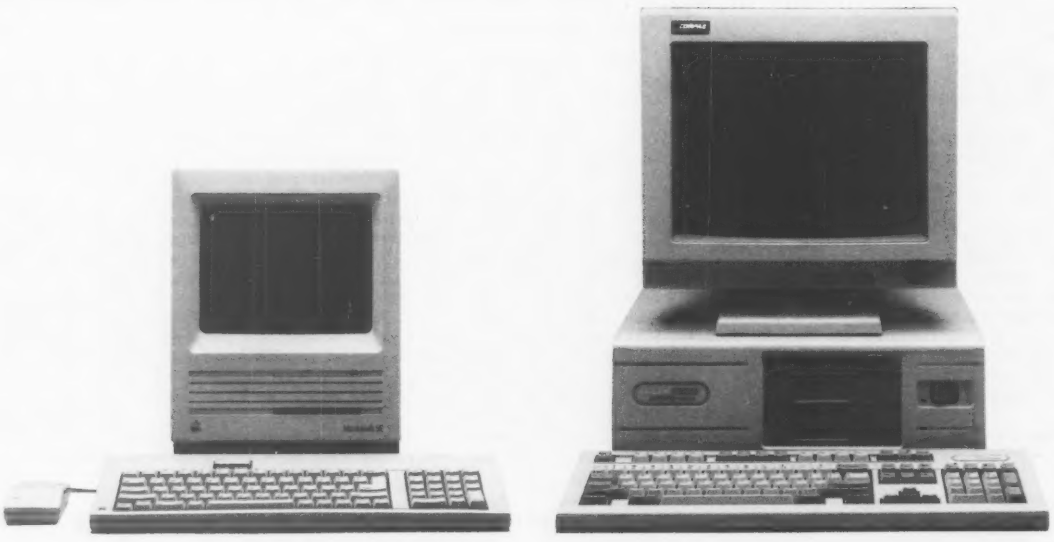

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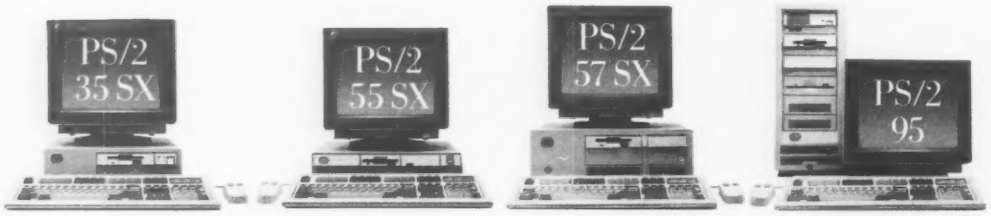

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Jukebox for VAX/VMS avoids DEC's interface

BY ALAN ALPER
CW STAFF

RESEARCH TRIANGLE PARK, N.C. — Alphatronix, Inc. has unveiled a rewritable optical-disc jukebox for large Digital Equipment Corp. VAX/VMS installations that circumvents DEC's proprietary SDI/STI interface.

Alphatronix's Inspire jukebox is equipped with a small computer systems interface that attaches to an optical storage card residing in a DEC hierarchical storage controller.

Other third-party vendors connect optical storage devices directly to DEC's hierarchical storage controller, an approach the Maynard, Mass., company claims infringes on patents covering its SDI/STI technology.

DEC is involved in numerous suits to protect its SDI/STI patents. The minicomputer maker recently offered not to sue vendors that allegedly infringe on the patents if they phase out their products before Dec. 30, 1992. Eighteen companies have taken DEC up on its phaseout offer, according to a DEC spokeswoman.

By not attaching to the SDI/STI interface, Alphatronix is able to offer a subsystem that provides more than 13G bytes of additional storage compared with SDI-specific jukeboxes, noted Richard Gardner, a vice president at the 4-year-old optical storage vendor. That is because users do not have to record DEC-specific formatting data on the optical discs used with Alphatronix's subsystem, he explained.

The jukebox also transfers data at rates 50% faster than competing products and, unlike SDI-compliant subsystems, can read VMS data stored on any optical disc that is formatted for the VAX operating system, Gardner said.

Inspire is priced at $69,500 for a jukebox offering 16G bytes of storage and at $196,000 for a 93G-byte subsystem, including the optical channel card. It is reportedly available 120 days after receipt of order.

Legent extends systems tools

Five Windows-based management products added for data center

BY JOHANNA AMBROSIO
CW STAFF

Legent Corp. has announced five personal computer-based systems management products. They include a capacity management package that runs under DOS and a tool to capture mainframe-based systems management information.

The products include three new ones and two that are new versions of existing products. Legent's general PC strategy, executives said, is to bring out products first under DOS and Microsoft Corp.'s Windows and then, if the market requires it, under OS/2 and Presentation Manager.

Brand new is Bundl PCview, a DOS-based version of Legent's mainframe-based electronic information management software. With Bundl PCview, users can access and view on-screen reports generated from the mainframe. Pricing ranges from $2,000 to $9,000.

As for the other PC packages, Legent said, exact pricing depends on the number of users and the network configuration.

The second new package is Optimodel, also for DOS, which allows users to predict a host system's capacity. Forecasting, planning and modeling functions are included, and a host component is required. Prices for the package range from $18,000 to $37,500.

Rounding out the new wares is MICS Easyreach, a front-end tool to capture information from Legent's mainframe-based MICS family of systems management products. Easyreach allows users to download information into popular PC applications, including Lotus Development Corp.'s 1-2-3. Pricing ranges from $10,200 to $20,300.

Additionally, Legent introduced OS/2 versions of two products that are already available for DOS. These include Endevor Workstation for OS/2, which provides change and configuration management for PC-developed applications, and Automate/XC, which allows data center employees to remotely operate IBM, Digital Equipment Corp. and Tandem Computers, Inc. machines and perform functions such as remotely restarting mainframes and message management.

Pricing for Endevor Workstation for OS/2 is $5,300 to $80,000; for Automate/XC, the price range is $2,600 to $13,600.

All five products will be generally available within the next two months.

BRAND NEW is Bundl PCview, a DOS-based version of Legent's mainframe-based electronic information management software.

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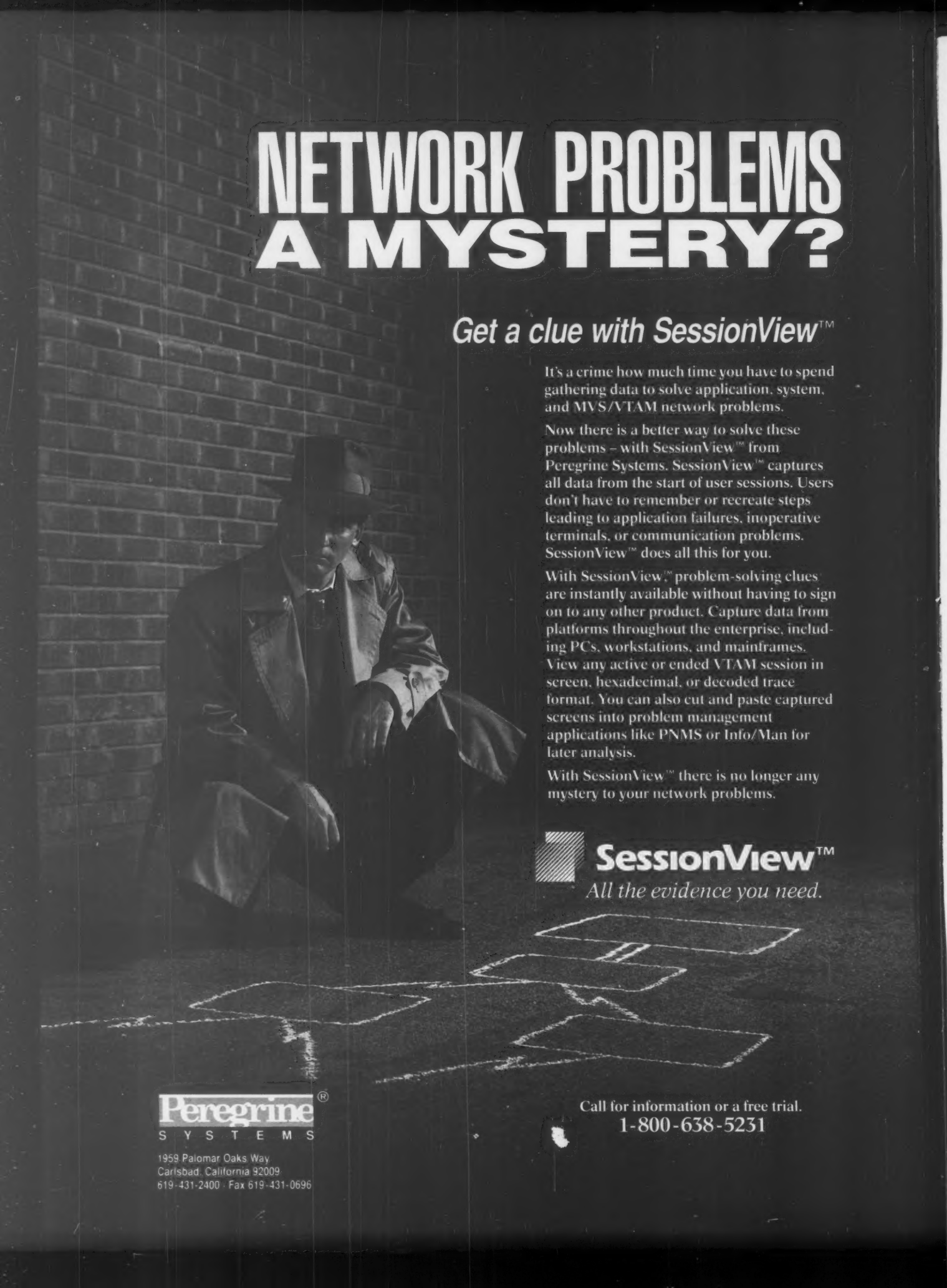
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Hospital taps EIS program

ON SITE

BY SALLY CUSACK
CW STAFF

BEECH GROVE, Ind. — Tricia Myton does not like the sound of "executive information system" (EIS).

The connotation of "executive" closes the software program to too many people, she explained, and in a hospital environment, that is not always an optimal situation.

Myton is product line manager for financial systems at Alverno Administrative Services, Inc., a corporate computing center for nine full-service hospitals and several nursing homes in the Midwest.

Alverno is developing an EIS-like program using SAS Institute, Inc.'s SAS 6.06 on an Amdahl Corp. mainframe under IBM MVS/XA.

Myton said she prefers to call the mainframe-based, interactive software a "business information system."

SAS is an integrated applications development program for enterprisewide computing. The vendor's next release, 6.07, will offer an EIS module, and programs are scheduled to ship by April 1992.

After evaluating several other EIS products, including programs from Pilot Executive Software and Information Builders, Inc., Alverno chose SAS primarily for its terminal-based mainframe connectivity.

"It was economics — the program can be accessed by IBM mouse-driven terminals or by standard personal computers," Myton said, adding that using terminals eliminates hefty training costs and hardware purchases. Alverno is using Attachmate Extra, a software emulation program from Attachmate Corp., to provide a mouse port on the mainframe.

SAS was also being used by programming staffs at the various hospitals, so a comfort level already exists in several areas.

However, Myton was quick to point out that the current development project "is something entirely new for us."

The business information system will be used by as many as 400 people, with the cutoff point most likely occurring at the level of department heads and above, Myton said. The system will be used as the management reporting system throughout the hospital network.

The pilot project is scheduled for completion by mid-January.

The level of user security will determine the level of user access. Top executives do need the information, Myton said, but there are other layers of personnel at the hospitals that need quick, easy access to a variety of information.

Alverno is currently working on a cardiac component of the software system, which will incorporate reporting functions, a database, textual and graphic data display and dynamic data sets.

Myton said that the finished pilot product will also give users the option of doing both standard reporting and ad hoc reports using a template.

When SAS 6.07 and the EIS module are delivered next year, Alverno's users will have additional capabilities.

For example, SAS 6.07 EIS will allow users to place a cursor on a segment of a graph and drill down within the graph itself.

Other features will include a type of dashboard monitoring, which will automatically highlight data variances.

Throughout 1992, Alverno plans to expand the program via the EIS module and convert more of the hospitals' existing data. The SAS EIS module will allow applications developers to incorporate data from a variety of sources, including SAS data sets, flat files and database management systems.

In addition to using financial data, Alverno has found it critical to include both clinical and case information.

"To give the BIS more life, it has to center on what you do and help you to be better at it," Myton said. "We treat patients — that is our business — and this helps us assure total quality in patient care."

Lotus' client/server route

CONTINUED FROM PAGE 27

frame applications and what they are doing, he said corporations are not ready to move those programs over to a client/server architecture because doing so requires a complete re-authoring of the new application at new levels in the organization.

Long-term plans are under way to transform the mainframe package into more of a client/server offering.

"We like to enhance 1-2-3/M to become more of a spreadsheet server and librarian so that the PC user connected to the host can access the whole library," Walsh said. Here, 1-2-3/M would be used as a spreadsheet consolidation engine, pulling in data from spreadsheets across the network into a centralized database. 1-2-3/M would then shift into gear as a distribution tool.

It would make sense, Dunkle said, suggesting that 1-2-3/M could function as a gateway into other midrange and mainframe packages.

Lotus might also expand 1-2-3/M's Spreadsheet Connection add-in to enable it to allow PC products to drive the mainframe in a client/server manner. Walsh said users could have a PC macro that uses the spreadsheet as a shell to fully automate the consolidation process on the mainframe. Desktop users may also be able to formulate the query on the PC before submitting it to the mainframe.

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NEW PRODUCTS — HARDWARE

I/O devices

Lexi Computer Systems Corp. has announced the Intermate AFP Kit and Intermate Video AFP Duplex Kit. Both products allow mainframe users to print using Hewlett-Packard Co. Laserjet printers.

The Intermate AFP Kit ($2,995) works with HP Laserjet II and III printers. It plugs into the printer's XIO option slot and provides Advanced Function Printing features.

The Intermate Video AFP Duplex Kit ($6,995) works with Laserjet III and IIID models. It includes a 3½-in. floppy drive for operating software and 8M bytes of resource memory.

Lexi Computer Systems
231 Sutton St.
N. Andover, Mass. 01845
(508) 681-1118

Hewlett-Packard Ltd. has announced a 14-in., reduced instruction set computing-based color X station.

The HP 700/RX Model 14CI uses the firm's X Window System V.11 R4 system for high performance. It includes 4M bytes of system memory and 1M byte of video memory and is compatible with HP and Sun Microsystems, Inc. computers.

The unit costs $3,495. Availability and specifications outside the U.S. may vary.

Panacom Automation Division
Hewlett-Packard
24 Lexington Road
Waterloo, Ontario N2J 323
(519) 886-5320

Power supplies

Alpha Technologies, Inc. released a 600 VA uninterruptible power supply system.

The Alpha UPS 600T ($849) offers up to eight hours of backup time and a mean time between failure rating of over 20 years, according to the company.

Alpha Technologies
3767 Alpha Way
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SOFTWARE

System software

Silicon Graphics, Inc. has unveiled Trusted Irix/B, a Unix-based operating system with advanced security features.

Trusted Irix/B is binary-compatible with the company's Irix 4.0 operating system and Iris 4D workstations. It is designed to meet U.S. Department of Defense security specifications, the firm reported.

The software costs between $2,000 and $5,000, depending on hardware platform.

Silicon Graphics
2011 N. Shoreline Blvd.
Mountain View, Calif. 94039
(415) 960-1980

Development tools

Lynx Real-Time Systems, Inc. has announced LDB, an X Window System-based debugging tool kit for real-time Unix applications.

LDB offers source-level and kernel-level debugging of multiple threads and multiple processes. The source debugger features break points, signal debugging, watch points and stepping. Remote debugging via Ethernet is also possible.

The initial release supports the company's LynxOS real-time operating system, with support for standard Unix variations to be offered at a later date.

LDB is priced at $895.

Lynx Real-Time Systems
16780 Lark Ave.
Los Gatos, Calif. 95030
(408) 354-7770

Languages

Must Software International has announced Version 5.5 of its Nomad fourth-generation language for mainframe systems.

The new release adds cross-mainframe access to data. It also offers improved graphics output and SQL support.

The software costs from $10,000 to $250,000, depending on processor size.

Must Software
101 Merritt 7
Norwalk, Conn. 06856
(203) 845-5000

Utilities

BGS Systems, Inc. has developed the Crystal DB2 Extractor, a utility that automates input into the company's Crystal software for predicting IBM DB2 performance.

The Extractor builds a performance model of DB2 applications based on objects defined in the catalog and plan table. The model can be evaluated by the Crystal Performance Evaluator without user modification.

The base price for the Extractor is $14,000 per central processor.

The company also announced the Best/1-VM DASD Consultant, a software product for tuning and reporting direct-access storage device performance in VM/XA and VM/ESA environments.

Pricing for the Consultant starts at $25,000.

BGS Systems
128 Technology Center
Waltham, Mass. 02254
(617) 891-0000

Computer-aided software engineering

Interport Software Corp. has announced Intercycle, a reverse-engineering product for moving mainframe Cobol code into a repository for efficient analysis and maintenance.

Intercycle provides a Common User Access-compliant interface and handles Cobol applications including databases, job control language and process code. It moves the code into the company's Metabase repository, which also integrates computer-aided software engineering tools.

According to the firm, the process cuts costs by moving maintenance processing from the mainframe to the workstation.

Intercycle runs under Presentation Manager.

Pricing starts at $5,900 per workstation seat, with a five-seat minimum requirement.

Interport Software
Suite 700
12150 E. Monument Drive
Fairfax, Va. 22033
(703) 385-1515

Applications packages

Process Control Industries, Inc. has announced a stand-alone Labor Scheduling feature for the Oasys Scheduling Software System.

The Labor Scheduling module is now available for VMS and Unix systems. It allows users to take into account production requirements, plant policies and qualifications when making work assignments.

The stand-alone portion starts at approximately $50,000, depending on hardware platform, number of users and connections to plant-floor devices.

Process Control Industries
300 Myles Standish Blvd.
Taunton, Mass. 02780
(508) 880-3650

Applix, Inc. has announced the availability of its Asterix X Window System office integration software on the Hewlett-Packard Co. Apollo 9000 Series 700 and 800 platforms.

The Asterix system integrates word processing, graphics and macro capabilities along with optional spreadsheets and electronic mail. Live links can be established between Asterix applications and third-party applications via the package's Extension Language Facility scripting feature.

The software costs $695.

Applix
112 Turnpike Road
Westboro, Mass. 01581
(508) 870-0300

Computervision has announced revisions to its Personal Designer computer-aided design software package.

Version 5.0 includes support for handling nonuniform rational b-spline curves and surfaces. It also allows dynamic placement of text and dimensions and features improved multiple views and text editing. Database capacity has been doubled in the new version.

Other new features include multiple-view hidden-line removal, a simplified dimensioning menu and additional dimensioning options.

The Personal Designer Surfaces module will be bundled with the package. The Unix version is priced at $4,495, and the DOS version costs $3,995.

Educational institutions can purchase the software at half price.

Computervision
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Argent, Inc. has announced the availability of its Jams Jobs Scheduling System Release 2.

The upgrade incorporates enhanced job dependency support and new security features.

It also offers remote beeper activation and supports unusual English-language date descriptors (such as "first Thursday of pay period"), the company said.

Jams runs on Digital Equipment Corp. VAX systems. Pricing ranges from $5,384 to $26,919, depending on the central processor.

Argent
49 Main St.
Torrington, Conn. 06790
(203) 489-5553

Uniras, Inc. has announced a package bundling its Unigraph+2000 1.2, Uniedit and Picture Manager applications.

The package provides a complete solution for visual data analysis, according to the company.

Unigraph+2000 1.2 provides data analysis, visualization and presentation capabilities. It also offers complex four-dimensional displays including flow and contour maps. Uniedit includes graphics design and editing functions. Pictures created in Unigraph+2000 can be annotated and enhanced for final output in Uniedit.

Picture Manager handles image manipulation and integration. The applications also feature a consistent interface, the firm said.

Pricing ranges from $4,500 on workstation platforms to $42,000 on supercomputers.

The product is available immediately.

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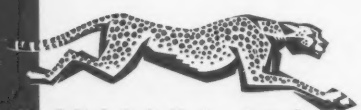

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Round 1: Windows word wars

Microsoft, Wordperfect compete nose-to-nose in latest releases

BY CAROL HILDEBRAND
CW STAFF

Although the actual brawl will not take place until the dueling shrink wraps leave their respective corners, the word is that forthcoming versions of Wordperfect Corp.'s namesake Windows package and Microsoft Corp.'s Word for Windows will be pretty evenly matched when the bell clangs for Round 1.

"I think that in this type of competitive marketplace, you have to expect the functionality will be quite comparable," said Judith Hurwitz, an analyst at Patricia Seybold's Office Computing Group in Boston.

Industry observers said that although Microsoft currently has a lock on the Windows-based word processing environment, Wordperfect's vast installed DOS base — estimated at 70% — will give it a leg up as it hits the saddle for the catch-up race.

However, Jesse Berst, editor of "Windows Watchers," a Calif.-based newsletter, noted that Microsoft has been very aggressive in ensuring that its product had most of the features planned for Wordperfect's upcoming Windows debut. "Microsoft is really taking Wordperfect on in the features war," he said.

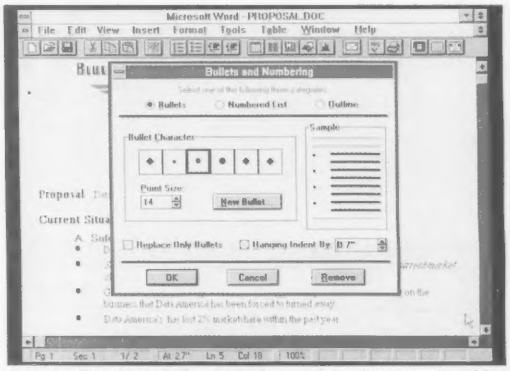
When it comes to a look at the two competing packages, a run-through of the features also shows a pretty level playing field.

Word for Windows, which is being touted as having simplified often-used functions, has revamped its tool bar and inserted such commands as SAVE, OPEN and a print function and has removed some that saw less of a need for.

"The tool bar is quite nice," said Steve Myli, a consultant and Microsoft Word beta-test user in Livermore, Calif. "You just click on an icon to send something to the printer," he explained.

Wordperfect is showcasing a similar feature, a customizable button bar that lets a user put his favorite commands and macros on the bar running across the top of the screen. "It's a terrific

Continued on page 46



Microsoft's Word for Windows 2.0 *features simplified functions and a new tool bar*

Quicker GUIs may come from Comdex debuts

BY MICHAEL FITZGERALD
CW STAFF

LAS VEGAS — While graphical user interfaces have become more popular, and some vendors would like people to think GUIs are a de facto standard environment today, many users find the environments slow, largely because of the amount of time it takes to redraw a screen.

Products released before or at Comdex/Fall '91, along with events at the show, may spur an easier transition to GUI environments.

Two trends were evident at Comdex: hardware- and software-oriented accelerators that were designed to run Microsoft Corp.'s Windows 3.0 and other GUIs faster, and a move toward high-resolution graphics on AT-bus machines through such technologies as IBM's Extended Graphics Array (XGA).

COMDEX/Fall'91

At a pre-Comdex meeting, the Video Electronics Standards Association (VESA), an industry consortium dedicated to video standards that includes IBM as a member, circulated a draft of its standard for an AT-bus XGA. XGA currently ships only for the Micro Channel Architecture (MCA) bus. VESA will vote on the standard in February 1992.

VESA also enacted a new Super VGA standard that allows for easier installation and configuration of high-level video boards that work with the older Video Graphics Array technology.

"Products that ship with the new protected mode interface will mean users will be able to run older applications at the highest level of their hardware and not be limited to just their software," said Scott Vouri, VESA's Super VGA committee chairman and president of Binar Graphics, Inc. in San Rafael, Calif.

Continued on page 46

The local option

Several Comdex exhibitors displayed what some think is the future of video technology: local-bus architecture.

The idea behind the local bus for graphics is that conventional graphics arrangements, where the CPU sends commands out to the graphics controller over the system bus, are too slow. With the video controller on the local bus, the CPU gains direct access to the graphics controller, increasing graphics speed by as much as five times.

"It puts graphics in the left lane of the highway," said Jake Richter, president of Panacea, Inc., a Londonderry, N.H.-based maker of graphics drivers.

At Comdex, Dell Computer Corp. displayed a local-bus version of one of its computers. Dell and several other firms participated in a VESA panel on local-bus architectures. VESA may form a committee to create a standard for local-bus implementations of graphics because one does not exist today. However, Jon Peddie, president of market research firm Jon Peddie Associates in Oakland, Calif., warned that "it could be a political problem because the IEEE is the traditional standards-setting body for buses."

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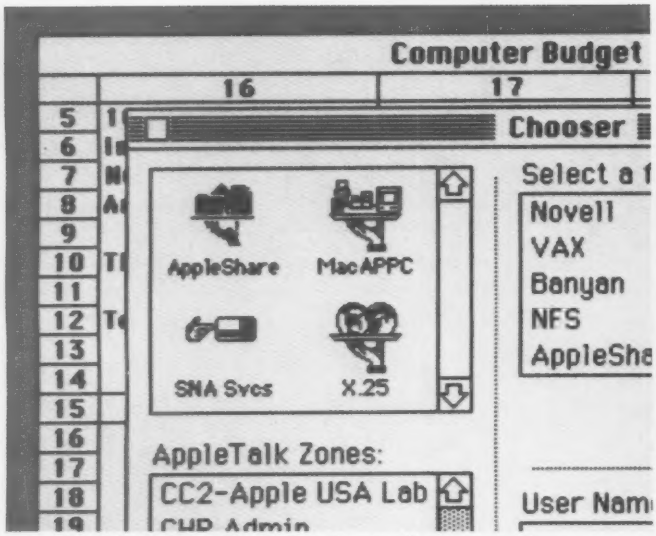
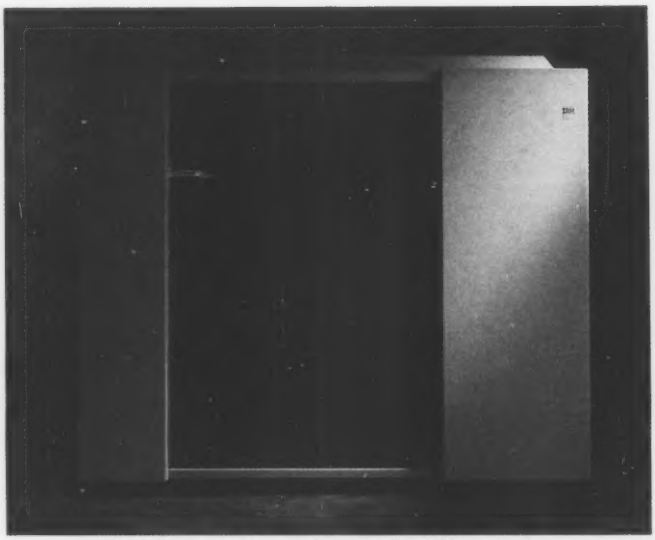
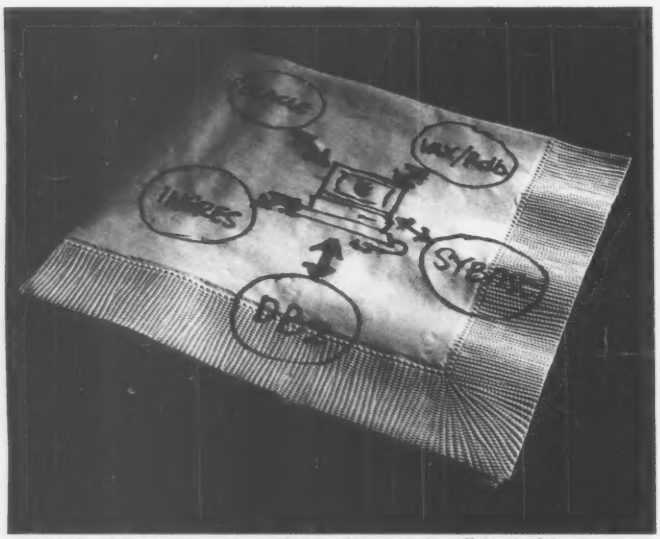


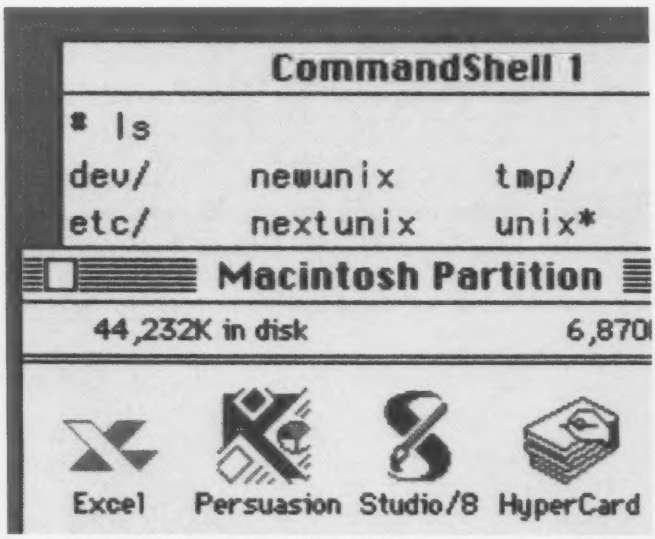
This is the Macintosh Chooser. A single point of access to a wide range of systems. The Chooser shows available network resources graphically and consistently. Just point the mouse and you're connected.



Macintosh offers an incredible range of tools for connecting with virtually any host-based environment, whether it's running SNA, TCP/IP, DECnet™, or OSI.



Apple's Data Access Language (DAL) adapts popular off-the-shelf database, spreadsheet, and data analysis software to major SQL environments. So nontechnical users can easily access remote databases.



Apple A/UX® lets Macintosh run UNIX® applications plus thousands of Mac® programs. At the same time you can run X-Window and MS-DOS applications, and cut, copy, and paste between any of them. No other desktop computer can do this.

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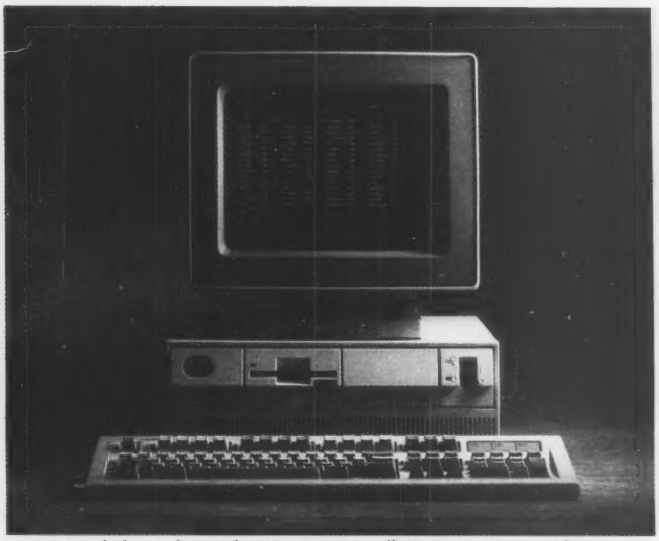
to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.

Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

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While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

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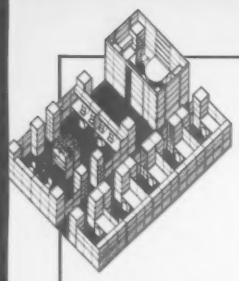

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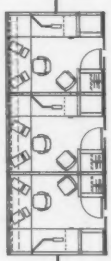

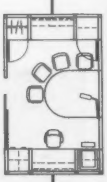

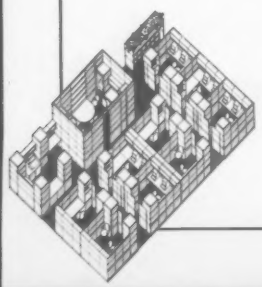

WANG **OFFICES THAT WORK**

Brown moonlights as a Macintosh fan

BY GLENN RIFKIN
SPECIAL TO CW

If there is anything Boston Celtics guard Dee Brown loves almost as much as basketball, it is his computer. In fact, Brown took heat all of his rookie season with the Celtics for toting his Apple Computer, Inc. Macintosh portable along on road trips.

"I used to get flak for being a computer nerd in high school and college, and I'm still getting it now," he says.

Brown, who got turned on to computers when he was 10 years old, was a computer science and math major at Jacksonville University in Florida.

Now 22, Brown is two classes shy of his degree, but earning those credits will likely be put on hold for a while because of his unexpected success in basketball.

The 6' 1" Brown was an unheralded college player and the 19th pick on the first round of the 1990 draft. But his impact in the National Basketball Association (NBA) was immediate and spectacular. He performed beyond anyone's expectations, walking away with the slam dunk contest at the 1990 All-Star game, leading the Celtics into the play-offs and being named to the All-Rookie team.

Unfortunately for Brown, a recent knee injury should cause him to miss the early part of the NBA season, which opened over the weekend.

Although Brown's love of computers hasn't abated, his time at the keyboard has, simply because preparation for the basketball season is so demanding. "If I wasn't playing basketball, I'd definitely be working with computers," Brown says.

Brown has been a computer buyer since the age of 11, when he saved up and bought an Adam computer, a now-defunct product from Coleco Industries, Inc.

Influenced by his mother's work as a computer analyst in the data center of a Jacksonville, Fla., bank, Brown grew up with the language of computers in his home. He taught himself how to program and didn't take a formal class in computing until he was in junior high school. By then, he'd purchased a modem, and he remembers "staying up 'til 2 or 3 in the morning hooking into bulletin boards."

In high school and college, Brown immersed himself in basketball and computers. "In college, while everybody was out partying, I'd be in my room at my computer," he says. "That was a good time to me."

The good times didn't include the *War Games* variety of hacking, Brown says, because he frowned on that kind of activity. But he smiles slyly and adds, "It was also because I didn't have the kind of hardware you needed."

Steve Lipofsky

The Celtics' Brown *used his PC in college to analyze opposing teams' moves*

He claims to be proficient in several programming languages, but he focuses on the Macintosh, using a translation program called SoftPC to tie into the IBM Personal Computer environment.

During his college career, Brown kept the statistics of his Jacksonville basketball team on his PC, along with a database of all the opponents he faced.

"I tracked their moves, their strengths and weaknesses, so I could use them the next time I faced them," he says.

Preoccupied with the intense grind of the NBA, Brown has not had a chance to update his database for the pros, but he says he plans to do that soon.

Brown is a realist, though. He knows it will be a long while before he persuades Larry Bird to log on.

Rifkin is a free-lance writer and a former *Computerworld* features editor.

Upgradable notebooks come with some questions

BY MICHAEL FITZGERALD
CW STAFF

As notebook vendors push toward the elusive goal of replacing desktop systems with small portables, they've started to add desktop-like features such as upgradability. Users, however, may be apathetic.

"I think it's a great concept, but I don't know that it would be a driving factor in any [purchase] decision we made," said Muriel Foster, director of information technology planning at the New York office of Coopers & Lybrand.

"If you get a basic machine, say a 20-MHz SX, the gain to go to a higher processing speed isn't much unless you're using some enormous spreadsheets," said Stephen Anderson, information systems architect for the State of Washington Department of Social and Health Services.

Anderson said that when multimedia becomes a reality, perhaps "five to 10 years from now," upgradable personal computers might make sense, but he said for now, 386SX processors from Intel and Advanced Micro Devices, Inc. provide plenty of power.

Upgrades available

AST Research, Inc.'s Premium Exec 286 notebook, based on Intel's 80286 chip, can be upgraded to an 80386SX processor. Other vendors offer upgradable pieces, such as Epson America, Inc., which gives users the option of upgrading the hard drive.

Recently, Toshiba America Information Systems, Inc. announced its T4400SX, which offers an upgrade path from the low-power version of Intel's 25-MHz I486SX to the 25-MHz 486DX.

However, Advanced Logic Research, Inc. (ALR) may have put itself in the forefront of upgradable notebook vendors recently, with its seven-pound VIP M notebook, which can be upgraded from a 20-MHz 386SX to a 25-MHz 486DX.

In addition, the VIP M series offers a Quik Snap module that allows users to snap on a Microsoft Corp. Ballpoint Mouse. The box comes standard with 4M bytes of random-access memory, expandable to 16M bytes, and 40M-, 60M- and 80M-byte hard drives are available.

ALR builds in a compression utility that it said will double the hard-drive capacity, precluding the need for an upgradable hard disk. Pricing starts at $3,495 for a 386SX, $3,995 for a 486SX and $4,495 for a 486DX. ALR will continue to sell its Venture line of notebooks.

While ALR product specialist Marc Tanguay said ALR thinks the VIP M will "replace the fear of obsolescence for the user," analysts pleaded skepticism.

"Unless you can complement it with full desktop capability, you don't need the horsepower of a 486," said Bruce Lupatkin, an analyst at the investment firm Hambrecht & Quist, Inc. in San Francisco.

"I don't think it's a breakthrough idea," said Gib Hoxie, head of Booz Allen & Hamilton, Inc.'s Information Industry Practice in San Francisco. "I find it hard to think about making major component upgrades without wanting all the other components at parity, so then you should get a new machine, which puts it all together the way it should be. A big deal right now would be screens you can read," Hoxie added.

However, William Bluestein, senior analyst at Forrester Research, Inc. in Cambridge, Mass., said he sees some possibility that notebook users might want the upgrade option because the market is driven largely by individual consumers.

Bluestein also cited the benefits vendors get from modularity, which can translate into faster development cycles and lower costs to end users.

"You don't have to redesign every component to get a product to market that way," Bluestein said.

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Round 1: Windows word wars

CONTINUED FROM PAGE 41

tool," said Robert Duncan, a writer at Cheetah Co. in Sherman Oaks, Calif. With all his writing and editing tools on the bar, he said, "I basically don't need to use the keyboard commands."

Other renovated Word functions drawing praise are a simplified mail/merge and an envelope printing feature.

"Instead of having to define everything, it walks you through the process," said one beta-test user, a manager at a California-based utility.

Another big feature being touted is Word's drag-and-drop text, which lets a user click on a specific piece of text and move it without having to cut and paste. While all users contacted agreed it was a great concept, some said they thought the nuts and bolts could use some work.

Duncan, who has looked at both products, said it gets a little cumbersome for users who want to move text to a spot not currently on the screen. "You almost need a third hand," he said. "In practice, is it any better than copy and pasting? I don't think so."

Both firms have done their homework in terms of easing the DOS transition, users said. Word features a pull-down menu that will guide a Wordperfect user through commands, executing, for example, a Wordperfect command such as F1 and showing the steps as it does so.

The California user said that this issue loomed large for his company. With a large, character-based Wordperfect user base and a growing Word for Windows segment, he said, Word's keystroke compatibility with Wordperfect commands was "a very important feature."

On the other hand, Wordperfect users were just as impressed with their product's features. "If I wanted the file manager, I would probably just click on the mouse, but if I happen to forget and use the character commands out of habit, it will still work," Duncan said, adding that he can use either the DOS keyboard or the Common User Interface-compatible board with little problem.

Some users reported slight problems with getting correct margins and fonts when converting files in Wordperfect for Windows, but they attributed it to beta-test software. Liz Tanner, a Wordperfect spokeswoman, confirmed that these issues are currently being addressed.

There were also some complaints about the disk space Word takes up, a hefty 14.5M bytes compared with 7.3M bytes for Wordperfect's product. Most users, such as Walt Zilahy, a second vice president in the information systems department at Hartford, Conn.-based The Travelers Corp., said that although it's a nuisance with many users accessing Word from a local-area network, "I'm not overly concerned about it."

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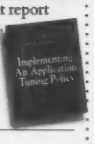

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CONTINUED FROM PAGE 41

Products compatible with either XGA, IBM's replacement for VGA, or the new Super VGA standard will not be available until mid-1992 at the earliest, most observers said. In the meantime, a number of companies released boards they touted as Windows accelerators:

- Video Seven, a unit of Headland Technology, Inc. in Fremont, Calif., announced its VRAM II Ergo card, which supports a 70Hz refresh rate. (A 70Hz rate is the VESA standard for monitor refresh rates. Graphics controllers constantly redraw screen displays, and as each line is redrawn, it begins to fade from the screen. Faster refresh rates reduce the amount of time it has to fade and reduce flicker.) The card also offers a combination of graphics controller hardware and software drivers to run Windows faster. Prices start at $399, and the product will be available in the U.S. in January 1992.
- Weitek Corp., a Sunnyvale, Calif., company, announced its Power for Windows card. The card features bit block transfer and line-draw functions, and Weitek claimed application speed is doubled for VGA (640 by 480 dots per pixel) and quadrupled for XGA resolution (1,024 by 768 dots per pixel). Weitek said the card would ship in first-quarter 1992 for $299.
- Genoa Systems Corp. in San Jose, Calif., released the Flickerfree Windows VGA 8800 board. This board supports monitor refresh rates of 70Hz, reducing screen flicker. Genoa claimed it makes 100% of the screen available for use. It supports up to 1,280 by 968 dots per pixel inch, has 256 colors and costs $495.
- Hercules Computer Technology, Inc. in Berkeley, Calif., released the Graphics Station Gold card, which offers 24-bit, or true color, capability, up to 32,768 colors and high-speed processing. It also gives refresh rates of up to 76Hz and comes in either AT-bus or MCA versions. The base model costs $495.
- STB Systems, Inc., a Richardson, Texas-based company, released its 1280 Graphics System, a controller that can support 1,280- by 1,024-pixel resolution with 16 colors. The cost is $599. The firm also offered the Wind/W GUI Accelerator, a card for AT and Extended Industry Standard Architecture buses that will sell for a base price of $399 and will support up to 1,280- by 1,024-pixel resolution.

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ComputerLand has the most experienced team of networking, training, and service professionals in the industry. Over 550 Systems Engineers and 2500 field service technicians, all with hundreds of hours of training. What's more, there are over 130 telephone technical support professionals at the ComputerLand National Help Desk, all trained to provide comprehensive support for more than 1,400 hardware and 130 software products.

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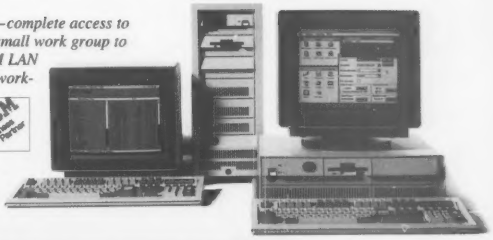
IBM PS/2 Model 95 XP 486, IBM PS/2 Model 90 XP 486



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Ed Anderson, President of ComputerLand, tells more: "We took a mainframe-oriented warehouse and transformed it into a 50-node PC network, with automated conveyors and bar-code technology. There's a quality audit at each of 4 or 5 different stages. We've ended up taking 95% of the errors out of the warehouse, while doubling the throughput with half the headcount.

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"An ordering process that formerly would have taken three days is completed in about three hours. And we can monitor order status and access product availability data directly."

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A major western bank asked us to create a wide area network (WAN) connecting existing PC LANs in 200 branch offices with a mainframe at company headquarters. But not during banking hours. Mission accomplished.
If your company has multiple offices, you may benefit from a WAN as well.

COMPUTERLAND DOWNSIZING FOR ACCOUNTING FIRM IS A CERTIFIED SUCCESS.

Douglas Moore, Shareholder and CPA at Lubbock, Texas accounting firm Mason Warner and Company P.C., had the same problem many businesses are facing: Much of his data resided on an 11-year-old mini that had reached the end of its life. And his 45 employees in their main and satellite offices had a variety of PCs on their desks—none of which were networked to the mini. It was an inevitable decision: purchase a new mini or downsize to the PC-based network his company needed to match their ever increasing workflow.

"We were basically running on 'sneakernet,'" says Moore. "That's where diskettes in cellophane envelopes are walked from desk to desk. That was the extent of our information transfer.

"ComputerLand became an easy choice very early in the search," he says. "Alfred Harding, Lubbock branch owner, impressed me with his hands-on experience and access to the worldwide resources of ComputerLand."

Says Harding, "This installation is a perfect example of how downsizing can be both technologically and economically superior to all other options." It consists of a 30 node network with COMPAQ DESKPRO 386s/20s and IBM PS/2 55SXs, running on Novell NetWare 386 with a SYSTEMPRO file server.

All data needed for the firm's auditing, tax and payroll services is stored on a "jukebox" optical drive with a 600MB platter—resulting in 6GB of storage.

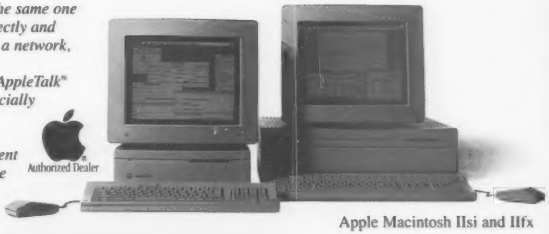
"This is an example of the true potential of downsizing. Our central file room once consisted of millions of files on casters. And our old mini used to take up an entire room. The SYSTEMPRO is much faster and 1/5th the size! I get all the black box catalogs, so I was able to evaluate all the pricing options. I'd say that ComputerLand's fair price — and their technical expertise—account for my extreme satisfaction with this installation."

Apple's approach to computer communications is the same one that guided the Macintosh design: Allow users to work directly and intuitively with information—whether it resides locally, on a network, a departmental computer or remote host.

Thanks to built-in networking capabilities and the AppleTalk® network system, the Macintosh excels at connectivity, especially in multi-vendor environments.

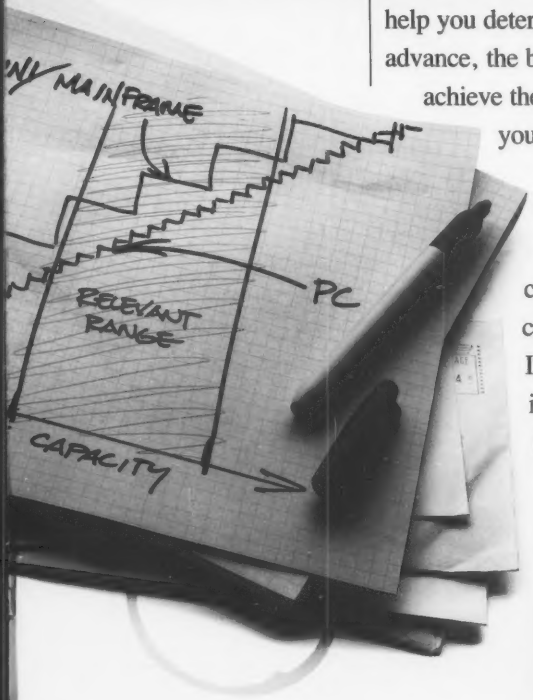
With AppleTalk, the resolution of protocol, architecture and interfaces is invisible. Whether your environment is SNA, DNA, OSI or TCP/IP. AppleTalk is also compatible with Ethernet, Token Ring and LocalTalk.®

Authorized Dealer



Apple Macintosh IIsi and IIfx

without downsizing benefits.



When you add to a PC LAN, your costs match your need for increased capacity. With a mini or mainframe, you're often committed to paying for more than you need.

help you determine, in advance, the best way to achieve the balance you need.

There's yet another important concept to consider: Incrementalism. With PC networking, we can help you add incrementally to your capacity so you pay for exactly what you need. Not more, as is often the case with minis and mainframes. What's more, if you're automating from scratch, PC LANs will deliver far more performance for the price than the larger machines.

The cost per MIPS on a machine like this is 10-50 times more expensive than on a PC.

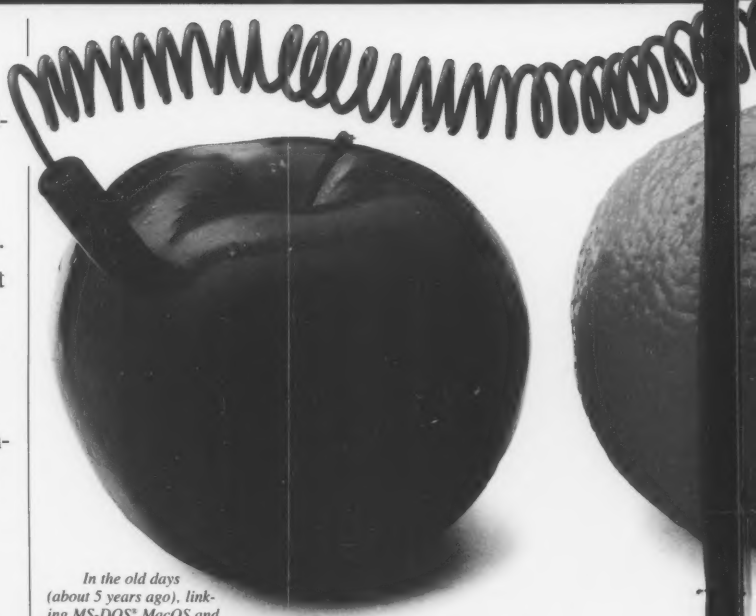
Building a network without

EVEN IF you're already convinced that PC networking is the greatest thing since the invention of the microchip, chances are you have some very valid concerns about implementation. Compatibility is probably one of the first.

At ComputerLand, we've learned which hardware and software best support multi-vendor connectivity requirements. Especially when you want to link Apple computers, COMPAQ DESKPRO®s and IBM PS/2®s—an assignment we successfully complete virtually every day.

You're also likely to be connecting PCs to minis or mainframes, which sometimes results in slow data response time. We can recommend technology to work out the kinks. In fact, we recently helped a large law firm with this very problem by adding a Macintosh® file server to a network connecting two DEC VAX™ 3100s with dozens of Macs and several PCs.

If security is an issue—and it usually is—we can help with software that controls user access at the appropriate level. From file servers down



In the old days (about 5 years ago), linking MS-DOS®, MacOS and UNIX® operating systems was a lot like mixing apples and oranges. Today, thanks to the maturity and stability of PC LANs, ComputerLand can provide elegant, reliable and low-cost solutions to interoperability problems.

Cabling may not be your first concern, but it's critical to the functioning of your network. At ComputerLand, we've connected PCs two feet apart and twenty floors apart. In newly constructed offices and buildings a century old. And we've worked with everything from twisted pair to fiber optics.

COMPAQ products have always been built around open industry standards—designed to work powerfully in multi-vendor environments. Today, Compaq is a leading supplier of PC network servers and a leader in technical innovation, as well.

To maximize compatibility and performance, hundreds of Compaq staffers work closely with official hardware and software Integration Partners, keeping up with product developments and support requirements. What's more, LAN configurations are simulated in the Compaq Systems Integration Lab to assure that COMPAQ products operate smoothly with those from other vendors.

So, whether you have a LAN or enterprise-wide network, whether you use Novell, Microsoft, SCO UNIX or Banyan software, COMPAQ PCs fit right in.

COMPAQ

COMPAQ SYSTEMPRO,
COMPAQ DESKPRO 386N

re-inventing the wheel.

to individual files. And since PCs now have sophisticated archival capabilities, data preservation can be ensured.

When the state-of-the-art Illinois Hazardous Waste Research and Information Center opened its doors, management turned to ComputerLand for state-of-the-art networking. Two interconnected Novell LANs were designed and installed. One to capture and share data from scientific instruments. The other to handle proposals, letters and other front office functions. Each using a COMPAQ SYSTEMPRO® as a file server. Now the agency is working effectively to map dump sites and define research funding priorities. And we can all breathe a little easier.

COMPUTERLAND CREATES A NEW PC LAN IMAGE FOR O.D.S. HEALTH PLAN.

[illegible] processes thousands of dental and medical insurance claims, resulting in a paper trail that, if laid end to end, would be many miles long. Their networking goal was to implement paperless image processing with a scanner in the mailroom, then electronically route each mailed-in claim through the company's process.

Bill Hockett is the Director of Data Processing at O.D.S. "In our industry, the mainframe is the backbone of claims processing. Then, for image processing, we chose the best software to electronically manipulate the forms—and that runs on a mini. Finally, to get integrated information to each claim representative's desk, a PC was the only answer.

"ComputerLand was not the lowest bidder—but it was obvious they had an incredible investment in technology and sales support. During a visit to the ComputerLand Technology Center in Portland, we met their systems engineers and service people, toured their local distribution center—including parts and inventory—and discovered a first-rate operation all the way.

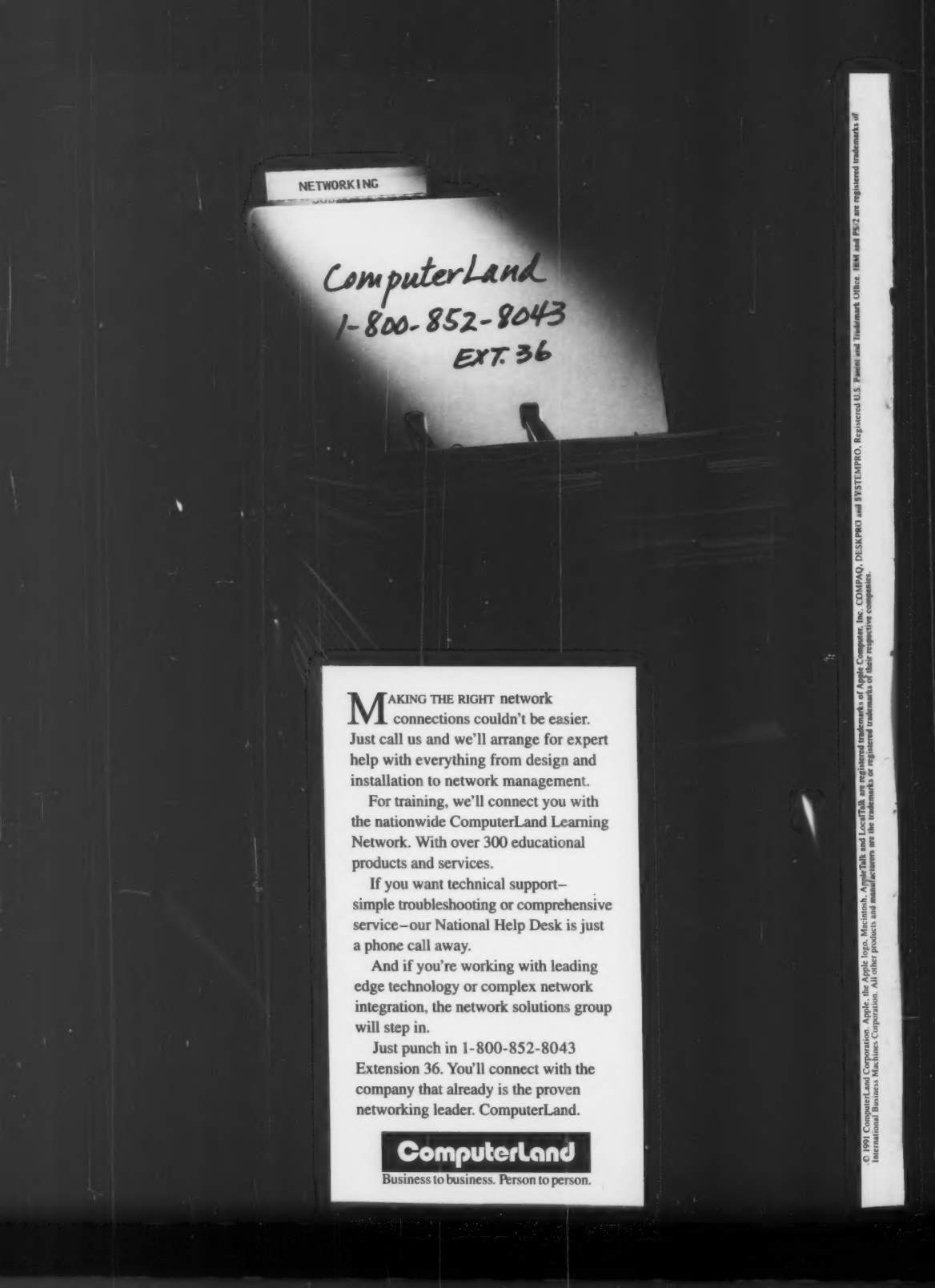
"The technology center perfectly replicated the environment we wanted. The systems engineer who designed that system is managing the project for us. What more could you ask for?"

Kevin Egan, ComputerLand's Marketing Manager in Portland says, "Our 5 full-time systems engineers—with over 25 years of data management/processing experience—have worked in many environments like the one at O.D.S."

Says Hockett, "They designed our network along with the OEM, and supplied technical expertise on connectivity. The power of the system comes from the fact that on every desk is a PC that has access to all resources on the network.

"ComputerLand is also configuring the PCs before they come to us—almost 90 of them—and doing it all, right down to unboxing and placing one on each desk.

"When it comes to PC LANs, I would highly recommend ComputerLand to anyone."



MAKING THE RIGHT network connections couldn't be easier. Just call us and we'll arrange for expert help with everything from design and installation to network management.

For training, we'll connect you with the nationwide ComputerLand Learning Network. With over 300 educational products and services.

If you want technical support–simple troubleshooting or comprehensive service–our National Help Desk is just a phone call away.

And if you're working with leading edge technology or complex network integration, the network solutions group will step in.

Just punch in 1-800-852-8043 Extension 36. You'll connect with the company that already is the proven networking leader. ComputerLand.

ComputerLand

Business to business. Person to person.

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Harvard Graphics 3.0: improved features

Technology Analysis — A round-up of expert opinions about new products. Summaries written by New Products Writer Derek Slater and Intern Lisa Davidson.

Harvard Graphics 3.0 from Software Publishing Corp. impressed reviewers with its range of functionality. This DOS-based charting package gives non-expert users expert results.

Ease of use: The newly created draw window and features containing chart option menus and scalable fonts make this version easier to use than its predecessors.

Charts: Numeric chart capabilities include pyramids, cylinders, pies and scatterplots. Also available is a depth-specified chart to create a three-dimensional effect. Version 3.0's text-charting abilities include Bitstream Speedo fonts, data tables and bullet charts.

Graphics: Despite limited import and export capabilities, Harvard Graphics 3.0 boasts a 500-symbol clip-art library.

Tools: In addition to screen shows that use scrolls, blinds, wipes and fades, Harvard Graphics 3.0 has "hypershow," a new feature that enables users to link charts via mouse or keyboard activation.

Value: At $595, Version 3.0 is one of the more expensive packages.

Software Publishing's Harvard Graphics 3.0

Reviews	Ease of use	Charts	Graphics	Tools	Value	Overall
Infoworld 7/8/91	Very good	Excellent numeric charts	Clever polygon fill	Good	Very good	7.5*
PC Week 6/24/91	Satisfactory	Wide array	Dramatically improved	Excellent presentation features	Most expensive	Good output
PC Computing 6/91	Interface still difficult	More chart types	Revamped drawing tools	Bitstream Speedo fonts	Well worth the cost	Best DOS-based package
Users						
Jim Bueche, Bull HN Information Systems, Inc.	■■	■■	■■	■■	■■	Looking forward to Windows versions
Laurel Wainwright, The New England	■■	■■	■■	■▗	■■	Adding text is fantastic
Dave Brundage, US West	■■	■■	■■	■■	■■	Excellent tool
Mike Parker, HQ Air Force Tactical Command	■▗	■■	■■	■■	■■	Really good project
Analysts						
Keith Thompson, Datalex Corporation	▮	■▗	■▗	▮	■▗	State of the art
Jerry Caron, Faulkner Technical Reports	■▗	■▗	■■	■▗	■■	Can't go wrong with Harvard

Key: ■■ Very good ■▗ Good ▮ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* rating based on 1-10 scale.

Vendor financial information

Software Publishing, based in Santa Clara, Calif., reported an 11% decline in revenue for its fourth quarter ending September 1991. Revenue was $37.7 million. The company reported a net loss of $25.2 million, reflecting nonrecurring charges of $27.2 million. Fourth-quarter 1990 net income was $3.6 million.

Software Publishing responds

Ted Simonides, product manager:

Tools: In Harvard Graphics 3.0 we have added new presentation management tools, such as global presentation options, that make it easier to build a consistent look across charts in your presentation.

Graphics: We added the import formats that are most widely used — CGN, PCX and TIFF. We will look to add others.

Freelance: Fast performance but still awkward

Lotus' Freelance 4.0

Reviews	Ease of use	Charts	Graphics	Tools	Value	Overall
Infoworld 6/24/91	Good	Very good	Snappy clip art	Good	Good	6.5*
PC Week 6/24/91	Satisfactory	Satisfactory variety	Complete drawing tool set	Customized outliner	NC	Greatly improved
PC Magazine 5/14/91	More graphical	Word charts easier	NC	Still has limitations	Hard to do better	Adds power and convenience
PC Computing 6/91	Interface somewhat daunting	Gallery of 55 types	NC	Ninety presentation backgrounds	NC	Should go over very well
Users						
Richard Tache, Ford Motor Co.	■■	■▗	■■	■■	■■	Extremely successful
Leslie Tyler, That Corp.	■■	■■	■■	■■	■■	High-quality results
Dan Saint, Chrysler Corp.	■■	■■	■■	■▗	■■	Beats competition hands down
Henry Draughon, H. W. Draughon & Associates	■■	■■	■■	■▗	■■	Good package
Analyst						
Keith Thompson, Datalex Corp.	■▗	■▗	■▗	▮	■▗	Very competitive

Key: ■■ Very good ■▗ Good ▮ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1-10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Wendy Abramowitz, Argus Research Corp.	▮	▮
Alfred Tobia, Mabon Securities Corp.	■▗	■■

Analyst ratings based on results through the second quarter. Third-quarter results for Lotus were revenue of $218.8 million, a 37% increase over 1990, and net income of $21.5 million, a 151% increase over 1990.

Lotus responds

Greg Mancusi-Ungaro, product marketing manager:

Ease of use: The recurring theme from the majority of our users is to make the product smoother and make it easier to create a presentation quickly, so we've eased the urgency with which we're adding drawing tools.

Our focus is going to be on increasing usability.

Lotus Development Corp.'s Freelance Graphics for DOS staves off old age with Version 4.0, reviewers said. It is not the most intuitive package, but it stands tall in charting with a new outliner and chart gallery.

Ease of use: The interface is smoother in Version 4.0. Mouse support has been improved, and Freelance also offers very fast performance. Compared with presentation software running under Microsoft Corp.'s Windows 3.0, however, Freelance is still somewhat awkward.

Charts: Reviewers said text charting is easier in Freelance than in any other presentation package because of the inclusion of a slimmer version of Symantec Corp.'s Grandview outliner. The chart gallery offers easy access to number chart templates.

Graphics: Aside from a few missing features, such as fitting text to a curve, Freelance offers a strong set of drawing and editing tools. A good collection of clip art and chart symbols is included, along with coloring, resizing and snap-to-grid functions.

Tools: Presentation tools are improved, though still not outstanding, reviewers said. A set of standard color backdrops gives slide presentations more consistency.

Value: Freelance Graphics 4.0 costs $495. It is a good choice for presenters who can sacrifice a little flash but require excellent text charts.

COMMENTARY

Jesse Berst

The safe way to move to GUI

It's smart to learn from your mistakes, but it's even smarter to learn from the mistakes of others. Thousands of companies have already started moving to a graphical user interface. You can benefit from the experiences of those pioneers. Successful migrations typically use the following six strategies:

• **Plan where you want to go.** "You'd be shocked how many companies skip this crucial first step," claims Christine Comaford, president of Corporate Computing, a Sausalito, Calif., consulting firm that specializes in downsizing and client/server applications. "To have a successful migration, you must know what you want to get from it. That means setting milestones and deliverables you can demonstrate to upper management."

• **Choose the route.** "It's clear the world is going GUI," says Don Weimann at Chevron Information Technology Co. "Now, every application area has to decide how to do it." Most corporations have two basic choices: They can put a GUI face on their existing mainframe applications, or they can downsize the source code itself.

The first option makes sense when you have a lot of code and data on the mainframe and enough resources to give acceptable performance to users. You leave the code base on the mainframe and use Windows or Presentation Manager to give users point-and-click access. For instance, Attachmate (Extra), Wall Data (Rumba) and others make excellent products that simplify micro-to-3270 connections via Microsoft's Windows.

Weimann calls these products "frontware," and he says they represent a "tactical" approach that buys some time. "There's such a legacy of older systems, you're not going to get rid of them pronto. You have to find a transition method."

The second option — downsizing — may be better if you have hard-to-maintain applications from the 1970s, if it's tough to get at the data on the mainframe or if you don't have enough servers to handle all your users. In such cases, some corporations are moving the code base to a LAN with GUI workstations.

How do you choose between the two routes? "Find out where the pain is and fix that first," Comaford counsels. "If it's on the desktop, you can put a pretty face on your mainframe apps. But if performance is the bottleneck — if you don't have the processing power to service your users — then you might want to investigate the viability of migrating to PCs."

• **Pick the platform and the tools.** Your next step is to choose a GUI platform and the tools to get you there. Fortunately, your programmers won't have to start over from scratch.

Some companies mistakenly assume they must send their programmers off to Microsoft University to learn C programming. That's not the case.

For instance, there are excellent tools available to help Cobol programmers make the transition from character-oriented Cobol to GUI programming. Products such as Micro Focus Cobol/2 insulate programmers from learning the GUI at the code level.

• **Set up a pilot project.** At this stage, it's important to resist the urge to run out and start installing GUI workstations. First set up a pilot program in which you can iron out problems. It will take some trial and error to come up with a working configuration you can safely roll out to end users. As an IS professional, you undoubtedly understand the politics of pilot programs. It's important to choose a highly visible group with enthusiastic, knowledgeable workers. And it's important to pick an application with an immediate, obvious payback.

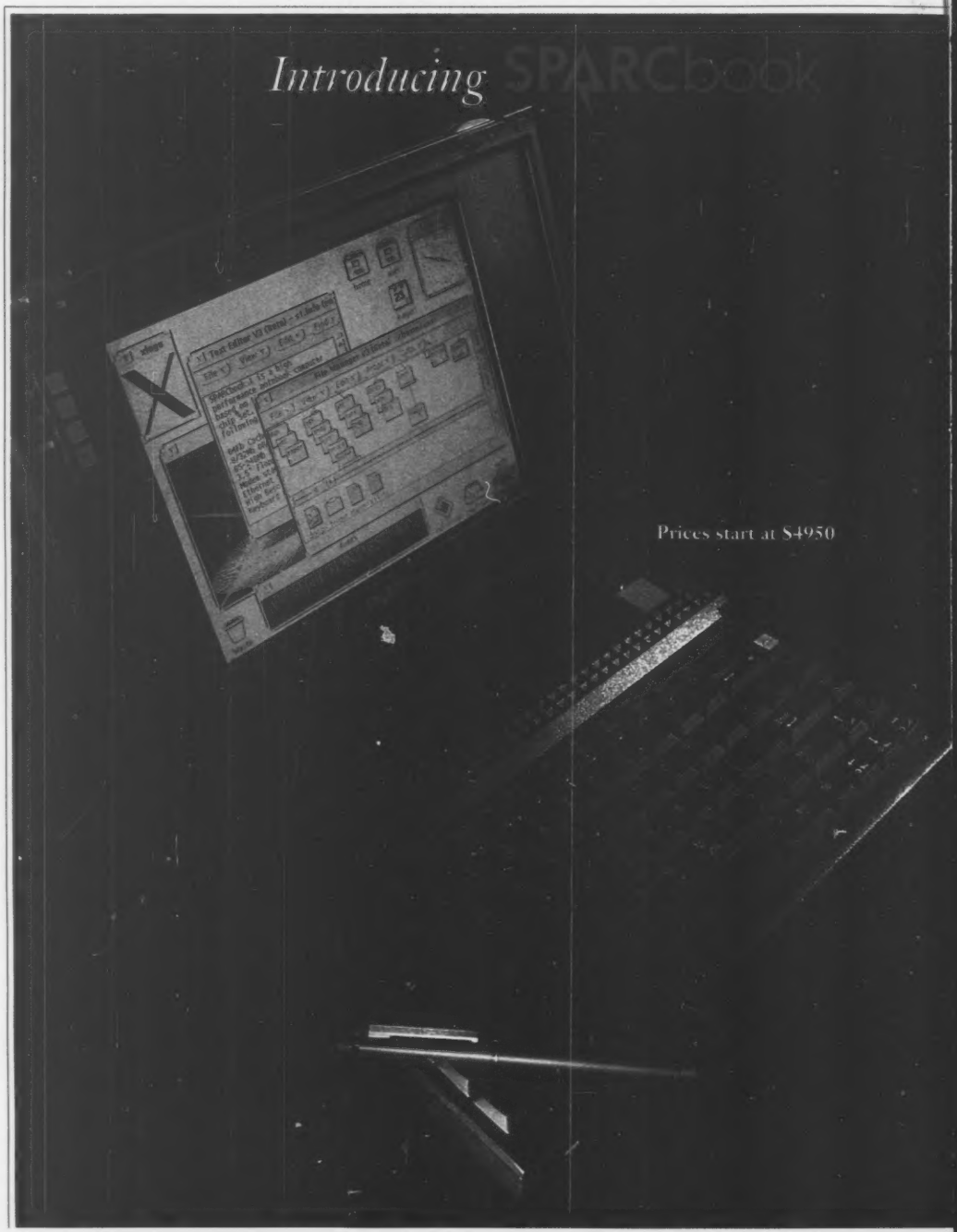
• **Create champions.** The pilot program is your first opportunity to create internal champions to evangelize the rest of the company. "There will always be resistance, so you can never have enough support," Comaford says. "Having good internal PR makes a world of difference."

At Chevron Information Technology, each work group has a dedicated PC coordinator, according to systems analyst Terry Eaton. As Chevron migrates to Microsoft Windows, it gets these people up to speed with "Tech Talks" and other training methods. "We're careful to get the expertise to those who can shorten the learning curve for the rest of the group," Eaton says.

• **Migrate gradually.** Once you can point to a success story, you're ready to start moving the rest of the company to the GUI. Everyone agrees that it's important to move gradually, one group at a time. Trying to migrate en masse guarantees a drop in productivity and a massive headache for your support people.

Looking to minimize the headaches and hassles of moving to a GUI? The consultants and users I talk to say the six steps listed above are the best way to take the pain out of Windows.

Berst is the publisher of "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.



Third parties pump Apple's Powerbook

BY JAMES DALY
CW STAFF

The arrival of Apple Computer, Inc.'s trim Powerbook series has launched a torrent of add-on products from third-party vendors who said they believe pent-up demand for a lighter and more affordable Macintosh portable will make the new line an instant success.

Within hours of the Comdex/Fall '91 introduction of the three-member series, dozens of third parties announced products that reportedly give users of the Powerbook 100, 140 and 170 increased performance. Several vendors will provide products that help remote Powerbook toters keep in close contact with their main office. They include the following:

- PSI Integration in Campbell, Calif., has announced its internal $299 Powermodem, which couples a 2,400 bit/sec. data modem with a 9.6K bit/sec. send and 4,800 bit/sec. receive fax modem.
- Lifetime Memory Products, Inc. will provide the Notebook Fax Modem, a $295 V.32 card that sends and receives faxes at 9.6K bit/sec. and has 2,400 bit/sec. data modem capabilities, officials at the Huntington Beach, Calif., firm said.
- Dante Development Corp. in Berkeley, Calif., has unveiled Inertie, a $149 application that maintains a consistent work environment on both Powerbook and desktop Macintoshes, automatically copying files over the small computer systems interface (SCSI) bus or Appletalk network to keep each computer up-to-date.
- Lotus Development Corp. is developing CC:Mail Macintosh Remote, which will allow Powerbook users to exchange text, files, graphics and fax items with local-area network-based CC:Mail users. It is slated to ship in the first half of next year.

Other third-party providers have built add-ons that let the Powerbook use external monitors or projectors to show a replica of the internal screen. Among the new introductions are the following:

- Computer Care, Inc. in Minneapolis announced Bookview and Bookview Imperial, which allow the Powerbooks to be hooked up to external monitors. Both products plug into the internal motherboard and require no special modifications.
- Envisio, Inc. in White Bear Lake, Minn., unveiled three display adapters that enable Powerbook users to drive 13-, 15-, 19- and 21-in. displays, as well as any IBM Video Graphics Array-compatible display or projection device. The Notebook Display Adaptor starts at $695.
- Rasterops Corp. announced the Clear Vue/PD 21, a two-page display that includes an accelerated SCSI graphics interface as part of a 77 dot/in. monitor. The Clearvue/PD 21 will be priced at less than $2,000 and is expected to ship in the fourth quarter.
- Aura Systems, Inc. unveiled Scuzzyview, a portable 2-pound display controller that connects the Powerbooks to color and monochrome displays, presentation monitors and LCD panels by offloading the screen rendering through the SCSI port to an external graphics processor. Expected to ship in December, Scuzzyview will sell for about $700, officials at the Carlsbad, Calif., firm said.
- Lifetime Memory Products also unveiled the $395 Notebook Video Board, which provides monochrome video output for the entry-level Powerbook 100 and eight-bit video output for the Powerbook 140 and 170.

Memory boost

Powerbook owners who want to increase the memory capabilities of their diminutive machines have several options, including the following:

- CMS Enhancements in Irvine, Calif., announced its Litedrive line, a pair of 40M- and 80M-byte 2½-in. internal drives that will sell for $699 and $999, respectively. A 100M-byte drive is expected early next year.
- Powerbook random-access memory expansion is possible using two memory cards from Newer Technology in Wichita, Kan. The first card offers 6M bytes of added RAM and was designed to fit the Powerbook 140 and 170. A second card affords a 2M-, 4M- and 6M-byte expandable design that fits all three Powerbooks.
- PSI Integration has also introduced the Powermemory series of expandable RAM cards, which allow users to increase the Powerbook memory in 2M-byte increments up to 8M bytes.

Some software vendors have also trimmed down their applications to better serve the portable. Paragon Concepts, Inc., for instance, has developed a new version of its Nisus word processor that requires considerably less disk space than the full-blown version. Nisus Compact will cost $150, and it is expected to be available later this year, a spokesperson from the Solana Beach, Calif., company said.

Connecting to Ethernet networks will be easy for Powerbook users, thanks to the introduction of several connectivity products, including adapters from Asante Technologies, Inc. of Sunnyvale, Calif., and Dayna Communications of Salt Lake City.

Meet the Notebook that Breaks the Mold

At just 6.8 pounds, SPARCbook 1 is light enough to carry comfortably and small enough to fit in your briefcase. Yet it incorporates the same power as the world's most popular desktop workstations from Sun Microsystems, including: a SPARC RISC processor sustaining 18 MIPS, 8 to 32 MB of fast DRAM and up to 240 MB of disk space.

PROCESSOR	25 MHz SPARC™
DRAM	8 MB or 32 MB
DISK OPTIONS	85 MB to 240 MB hard disk; 1.44 MB 3.5" floppy drive
LCD	640 x 480 monochrome resolution; color available Q1'92
COMMUNICATION	Ethernet and modem with SendFax
BATTERY POWER	Removeable NiCad battery: 4 hours normal operating time
KEYBOARD	82-keys with integrated MouseKey; 12 function keys
DIMENSIONS	11.8" x 8.5" x 1.9"
WEIGHT	6.8 pounds (with battery)
BUNDLED SOFTWARE	Solaris 2.0: SunOS SVR4 operating system, Open Network Computing (ONC),Open Windows V3 and DeskSet Tools; SunOS 4.1 and SunView Binary Compatibility Packages; modem, Ethernet and power management software: 80386 DOS emulation

Now you can run UNIX and DOS applications unmodified— anywhere. SPARCbook comes with Solaris 2.0, SunSoft's UNIX SVR4 implementation, enhanced for battery operation and Insignia Solutions' MS-DOS emulation software.

In the office, SPARCbook is a powerful desktop workstation. It connects to your corporate Ethernet network and simultaneously supports a VGA display for high-resolution color graphics.

On the road, it travels with you to business meetings and into the field for sales, service and maintenance calls. SPARCbook's innovative MouseKey integrates the convenience of an external mouse into the keyboard. An internal 2400-baud modem with SendFax® capability puts you in touch with information and people at the office—or around the world.

A sophisticated power management system ensures data integrity and maximizes the life of your battery. For less demanding applications, you can conserve battery power by switching the processor's speed from 25 MHz to 12.5 MHz. While automatic SAVE and RESUME functions protect your system from unexpected power down.

Tadpole's limited warranty protects your productivity with toll-free technical support and prompt hardware repair free for one year.

SPARCbook 1 is the only workstation that offers the performance and versatility you need—whether you're in the office or on the move.

Find out more about SPARCbook today. Fax us at 512-338-4462 or call:

800-232-6656

T A D P O L E

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BEFORE YOU BUY A UNIX SUPER SERVER OPEN THIS.

The superserver has become one of the hottest topics in the computer industry today. And one superserver in particular is being singled out more than any other: the application DEC™ 433MP.

It was recently called "the best of the Intel®/UNIX®-based superservers to be introduced to date" by the Aberdeen Group, a key industry consultant. They also proclaimed it quite simply: "the superserver of the future."

If you're in the market for a superserver, you'll want to read what else they had to say about the applicationDEC 433MP.

DIGITAL'S applicationDEC 433MP JUDGED BEST.

Just call any of the Authorized Distributors to the right for a copy of the report.

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DIGITAL. THE OPEN ADVANTAGE.

It's no secret that multi-processing UNIX technology offers powerful advantages over single-processing, but what you may not know is that upgrading is now more attractive than ever. Because if you buy an applicationDEC 433MP before Dec. 31, 1991, you can get a second processor at half price. For more details, contact any of the Authorized Distributors listed below.

Almac Electronics
14360 S.E. Eastgate Way
Bellevue, MA 98007
800-426-1410

Avnet Computer
10950 W. Washington Blvd.
Culver City, CA 90230
800-426-7999

MTI Systems, Arrow Electronic
25 Hub Drive
Melville, NY 11747
800-645-6530

Pioneer Standard
4800 131st Street
Cleveland, OH 44105
800-874-6633

Pioneer Technologies
15810 Gaither Road
Gaithersburg, MD 20877
800-227-1693

Wyle Laboratories
128 Maryland Street
El Segundo, CA 90245
800-289-9953

NEW PRODUCTS

Systems

NCR Corp. has announced a personal computer based on Intel Corp.'s I486SX processor.

The NCR 3335 is an upgradable Micro Channel Architecture system. It includes integrated Super VGA support for 256-color display output.

A base configuration with a 100M-byte hard drive and 4M bytes of random-access memory is priced at $4,985.

NCR
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-5000

Software applications packages

Geoworks has announced the Personal Office series.

The series provides word processing, drawing and design and desktop management applications at $70 each.

Geoworks Writer includes nine typefaces, a clip-art collection and more than 45 document templates. Geoworks Designer offers what-you-see-is-what-you-get, object-oriented graphics creation. Geoworks Desktop offers disk and file management capabilities along with a communications program.

Geoworks
2150 Shattuck Ave.
Berkeley, Calif. 94704
(510) 644-0883

Time Line Version 5.0 has been announced by Symantec Corp.

Time Line is a project management software package for personal computers running DOS. The new release offers a Multiple Project Resource Leveling feature for more efficient work-group use, the firm said.

Other new features are Individual Resource Calendars and Task Splitting, Varying Resource Availability and Costs Over Time.

The product, available immediately, costs $699, or $599 for a simultaneous network node version. Registered users can upgrade for $129 through mid-December.

Symantec
10201 Torre Ave.
Cupertino, Calif. 95014
(408) 253-9600

Contact Software International, Inc. has announced Version 2.1 of its Act contact management software.

The new release features macros and fax capabilities through Intel Corp.'s Satisfaxtion and compatible add-in fax boards. It also adds database passwords and enhances support for import/export of database files. Act 2.1 costs $395.

Versions of Act have also been announced for use with Hewlett-Packard Co.'s HP 95LX palmtop computer, the Apple Computer, Inc. Macintosh and pen-based computers.

Contact Software International
1625 W. Crosby Road #132
Carrollton, Texas 75006
(214) 418-1866

Frame Technology Corp. has begun shipping Framemaker 3.0, its document publishing software, for Next, Inc. workstations.

Framemaker 3.0 for Next includes conditional text, support for 24-bit color Adobe Systems, Inc. Postscript-compatible output and enhanced support for foreign languages. It also allows users to easily incorporate data tables into a document, the company reported.

The software costs $795.

Frame Technology
1010 Rincon Circle
San Jose, Calif. 95131
(408) 433-3311

Peripherals

The Panther 1000 *offers increased storage capacity*

Tandberg Data, Inc. has announced the Panther 1000, a ¼-in. tape cartridge storage system.

The Panther 1000 provides over 1G byte of storage without compression for personal computers, workstations and networks. Backup/restore time for 1G byte of data is less than 60 minutes, the company said.

The external subsystem costs $2,995 for Sun Microsystems, Inc. workstations and $3,245 for PCs. A version for Apple Computer, Inc. Macintoshes costs $3,495.

Tandberg Data
Suite 600
2649 Townsgate Road
Westlake Village, Calif. 91361
(805) 495-8384

Best Power Technology, Inc. has announced additions to its Fortress line of small uninterruptible power systems.

Fortress power units provide no-break power for personal computers, networks and smaller midrange systems. New 950 VA, 1.3 kVA and 2 kVA models are priced at $1,049, $1,399 and $2,099, respectively. The new models provide seven to eight minutes of backup power at full load.

Best Power Technology
Box 106
Rte. 1, Highway 80 South
Necedah, Wis. 54646
(608) 565-7200

Development tools

Stingray Corp. has announced Embark Professional.

The product ($295) generates installation routines for new software applications. Both Embark Professional and the installation routines it creates offer IBM Common User Access-compliant interfaces. Generated programs can modify or create AUTOEXEC.BAT and CONFIG.SYS files.

Stingray
Suite 204
355 E. Central St.
Franklin, Mass. 02038
(508) 520-4562

Utilities

Nimbus Software Corp. has announced the Nimbus Report Writer for Borland International, Inc.'s Paradox relational database management system.

The Nimbus Report Writer incorporates advanced query functions and desktop publishing capabilities, according to the company. A word processor with cut-and-paste features and automatic word wrap is integrated into the application.

The software costs $249.

Nimbus Software
Suite 300
11080 S.W. Allen Blvd.
Beaverton, Ore. 97005
(503) 626-0595

Reference Software International has introduced a personal computer-based dictionary and thesaurus software package.

The software includes definitions for 180,000 words. It incorporates biographical and geographical information as well, and features wild-card and definition-based text search ability. According to the company, the program includes 50% more information than comparable packages on the market. It can be accessed from within most DOS-based word processors.

The Random House, Inc. Webster's Electronic Dictionary and Thesaurus College Edition costs $129. It requires 5.5M bytes of disk space.

Reference Software International
330 Townsend St.
San Francisco, Calif. 94107
(415) 541-0222

Mastersoft, Inc. has begun shipping Word for Word Professional Version 5.0.

The updated file conversion utility package includes support for over 90 file formats. It can convert files from one application to another, such as from a spreadsheet format to a word processing format. It also adds a number of conversion tools for running Apple Computer, Inc. Macintosh files in DOS-based personal computer applications.

The program costs $149. Upgrades are available for $39.95.

Mastersoft
Suite A-320
6991 E. Camelback Road
Scottsdale, Ariz. 85251
(602) 277-0900

Macintosh products

Fifth Generation Systems, Inc. has upgraded Fastback Plus for the Apple Computer, Inc. Macintosh.

Version 2.6 ($189) supports the advanced features of Apple's System 7.0 and also improves compatibility with the DOS version of Fastback Plus. The interface has also been simplified and the Data Encryption Standard is now supported.

Fifth Generation Software
10049 N. Reiger Road
Baton Rouge, La. 70809
(504) 291-7221

A two-page monochrome display for the Apple Computer, Inc. Powerbook series has been designed by Rasterops Corp.

The Clearvue/Powerdisplay-21 ($2,199) is a 21-in. monitor with dual small computer systems interface ports. It incorporates a graphics coprocessor for higher performance. Resolution is 1,152 by 870 pixels.

The display is priced at $2,199.

Rasterops
2500 Walsh Ave.
Santa Clara, Calif. 95051
(408) 562-4200

Database management systems

Micro Data Base Systems, Inc. (MDBS) has introduced software connecting its MDBS IV and M/4 for Windows database products to popular development languages.

The language interfaces allow users to develop database applications in Microsoft Corp.'s Visual Basic, Borland International, Inc.'s C++ and Symantec Corp.'s Zortech C++. MDBS IV is an on-line transaction processing database management system for client/server architectures, and M/4 is a standalone DBMS for Microsoft's Windows environment.

The interfaces for MDBS IV cost $1,175 each. For M/4 for Windows, each interface costs $195.

MDBS
Two Executive Drive
Lafayette, Ind. 47903
(317) 463-2581

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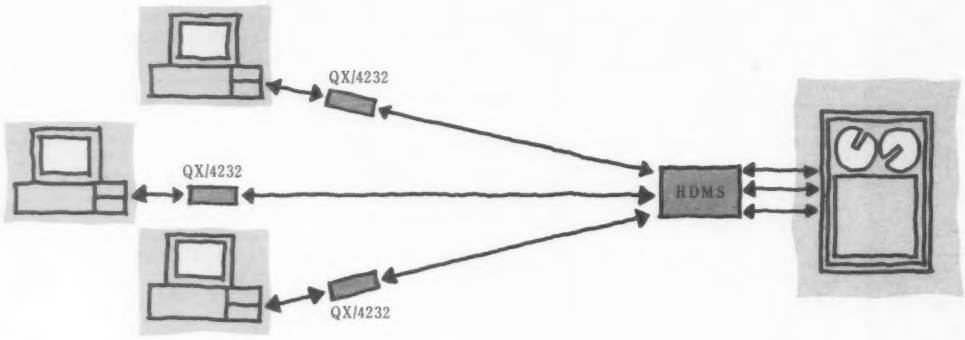

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NETWORK SHORTS

Kalpana certified

Kalpana, Inc., maker of the Etherswitch local internetworking product, has announced interoperability certification between its switch and **Netframe Systems, Inc.** servers running Multinet load-balancing software. Multinet allows the number of server users to be dynamically distributed across eight ports, and Etherswitch provides local, near-zero-delay inter-Ethernet switching. A Netframe server running Multinet, used in conjunction with Etherswitch, can reportedly deliver a server-to-network capacity of 80M bit/sec.

Workstation maker **Silicon Graphics, Inc.** said its Iris Graphics Library will be part of the common application programming interface announced by the **Advanced Computing Environment** (ACE) initiative for ACE Unix environments.

The Iris Graphics Library is an interface for creating computer applications that allows users to visualize and manipulate color images in real time, independent of windowing system or hardware platform.

Apple server headed for early twilight?

ANALYSIS

BY JIM NASH
CW STAFF

In the days since Apple Computer, Inc. introduced Appleshare Server 3.0, information systems managers and analysts have found themselves asking the same question: Who needs it?

Almost everyone — including Apple and its competitors — agrees that only a masochist would want to use anything other than an Appleshare server on an all-Apple network. Although technically possible, the cultural differences between DOS and Macintosh software would have some administrators gibbering in a week.

Robert Wohnoutka, Appletalk product manager at the Cupertino, Calif.-based company, said, "We're not trying to sell servers." Wohnoutka added that Apple's primary aim is to make Macintoshes a common feature on all computer networks.

That goal is coming into focus. Every major name in networking has announced or delivered Macintosh support that allows Apple networks to be run off of their own personal computer-based servers. They include IBM, Novell, Inc., Digital Equipment Corp., Microsoft Corp. and Banyan Systems, Inc.

Given that Macintoshes commonly exist in offices dominated by PC networks that increasingly have the power to absorb the little gray machines, industry observers said the role for Appleshare servers is limited.

Appleshare "was interesting while it lasted," said Mark Ryding, network manager at Evans and Southerland Computer Corp., a graphics software maker in Salt Lake City. "But it's terribly impractical" in heterogeneous environments. Ryding

Continued on page 55

Ripening
Integration of other technologies with Appletalk has been in the works for five years

- 1985 Tops licenses Appletalk.
- 1986 3Com supports the Macintosh with its 3+ network operating system.
- 1988 Apple announces Appleshare server, its first Appletalk Filing Protocol (AFP). Novell develops AFP and Appletalk protocol stacks for Netware.
- 1990 DEC, with its Pathworks networking system, supports AFP. AT&T Stargroup server supports AFP.
- 1991 IBM, Banyan and Microsoft all announce full support for AFP.

CW Chart: Janell Genovese

Consortium pledges nationwide net support

BY JOANIE M. WEXLER
CW STAFF

PLEASANT HILL, Calif. — The alliances sweeping the industry are not limited to equipment and software suppliers. A recently formed consortium of network integrators is linking arms across the country to serve companies needing consistent network support services across their geographically sprawling enterprises.

The consortium — once known as the Chicago 6 and recently renamed the Asset Group — is working with its first potential customer, Brown and Caldwell, a $90 million environmental services and consulting firm based here. The company is about halfway through rolling out a nationwide Banyan Systems, Inc. Vines internetwork, which it will use to leverage its business of assisting companies in meeting environmental regulations.

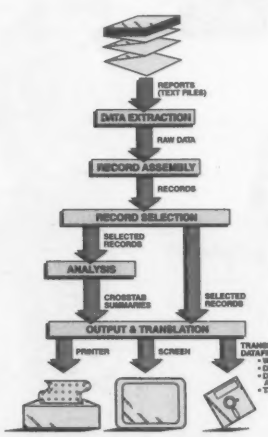
Brown and Caldwell is evaluating the Asset Group for "more cohesive planning information, rollout of upgrades, reporting on problems and, in theory, a better rate structure," said Jim Smith, Brown and Caldwell's manager of information services. All six founding Asset Group members were named Banyan Premier Resellers last month, which means that the firms offer a Banyan-specified level of Vines service and support.

Smith said he sees a benefit in getting a single point of contact in project leader International Micronet Systems, Inc., while each of his regional offices can work independently with the consortium's local member/integrator. The Asset Group valued the still-to-be-signed Brown and Caldwell contract at more than $1.2 million in consulting, hardware, software and installation services over two years.

Smith said he considers the alliance — formed in July — a "form of outsourcing that represents an extension of our staff, so I don't have to do a lot of hiring."

Smith pointed out that his company has many small offices without a lot of technical expertise. His alternatives, he said, would be to hire staff, use unrelated local resellers or hire expensive nationwide consultants with pockets of expertise. "Fortunately for us, the Asset Group had a good match of their members being in cities where we have offices," Smith said.

Continued on page 54



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Pair claims to have cracked encryption scheme

BY MICHAEL ALEXANDER
CW STAFF

The Data Encryption Standard (DES), a national standard for encrypting and decrypting electronic messages, has withstood constant assault by cryptoanalysts almost from the day it was adopted in 1977. However, two Israeli mathematicians now say they have found a crack in the encryption scheme that allows them to decipher messages under certain conditions.

DES, developed by IBM's Thomas J. Watson Research Laboratory in the early 1970s, is widely used by businesses and the federal government to protect information carried by computer networks. It is especially popular with banks and petroleum companies.

The two code breakers, Adi Shamir and Eli Biham, are expected to submit details of their work to the *Journal of Cryptology* in about two months, according to Gilles Brassard, editor-in-chief of the scientific journal. The mathematicians declined to speak publicly about their work until it is published.

"It's the first real serious attack on DES," Brassard said. To mount an attack using the mathematicians' new approach is feasible but tricky to pull off, he added.

"It has been well known for many years that you can break DES in one or two days if you are willing to spend millions of dollars to build special hardware," said Samuel Wagstaff Jr., a well-known cryptographer and number theorist at Purdue University in West Lafayette, Ill. "This is the only real success — an attack that is better than brute [computational] force."

What is also worrisome about the new attack is that it could lead to even faster and more sophisticated attacks, said John Carroll, a cryptology expert and professor emeritus at The University of Western Ontario in London, Ontario.

The National Institute of Standards and Technology (NIST), the branch of the U.S. Department of Commerce that certified DES as a national standard, is slated to re-evaluate in February 1993 whether DES will continue as a standard. The discovery of an Achilles' heel in DES, if verified, would have "a very significant impact" on whether the NIST would recommend DES as a standard, said Lynn McNulty, associate director for computer security. The many dozens of vendors who market hardware products that use DES technology would be affected if the NIST sets a new standard or pushes for a change in DES.

The approach developed by the Israeli cryptoanalysts is called a "chosen plaintext attack," which requires the code breaker to have the help of an inside accomplice or to deceive an opponent into enciphering an already known message. The technique aims to discern a pattern by comparing the known text with the ciphered text. The hitch is that the code breaker must have a significant number of messages to analyze. The Israelis have not said how many such messages would be required by their approach.

If DES users changed their keys fairly frequently — at least every day — it would probably be enough to foil a code breaker attempting to mount an attack using the new technique, said Hal Tipon, manager of information security at Rockwell International Corp. in Seal Beach, Calif. "It would be too laborious of a process to make it worthwhile."

Shamir and two other colleagues, Ronald Rivest and Leonard Adleman, are codevelopers of a cryptographic algorithm that is now offered as a commercial product by RSA Data Security, Inc. in Redwood City, Calif., and is sometimes touted as being more secure than DES.

Consortium vows network support

CONTINUED FROM PAGE 53

The Asset Group's mission is to set standards for delivering consistent service for multiple network operating systems, applications software and hardware configurations and to provide one point of contact for users to get information about their networks, said Alfred Chong, president of International Micronet. To that end, the founding integrator members' networks — which all run Vines — have been linked, he said.

Brown and Caldwell's Smith

In addition to International Micronet, the Asset Group comprises BFA Sales Division; Dataaids; Ilan, Inc.; Integrated Systems Group, Inc.; and Trellis. Last week, the consortium locked its infrastructure into place, Chong said.

Smith acknowledged that "while in concept it sounds great, I still have some reservations." Until the integrators — also competitors — have proven to Smith that they can work effectively together, Brown and Caldwell will only pilot their services. "We wouldn't sign any long-term contract until then," Smith said.

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Apple server headed for twilight?

CONTINUED FROM PAGE 53

was joined by a chorus of observers who said Apple has optimized its products to capitalize on ease of use.

Macintoshes gained their popularity not by being the fastest and most connected but because of their graphical user interface, several users noted. Uglier and relatively more difficult-to-use DOS machines have used muscle and networks to differentiate themselves. Today, they said, PC servers have more power and are less expensive than Appleshare servers.

A spokesman for Microsoft, maker of LAN Manager, said PCs are better than Macintoshes at serving mixed environments. Users have not demanded the same performance from Motorola, Inc. microprocessor-based Apples as they have from Intel Corp. microprocessor-based PCs.

Wohnoutka said he agrees that Appleshare Server is likely to be most popular in solidly Macintosh settings. "It's purely a function of experience. If you know [Novell] Netware, use it." But he bristled at remarks that Appleshare is overpriced and undergunned. "Until Netware 3.11 came along, Appleshare was the fastest server for Macs on the market," he said.

As for price, Wohnoutka said, Apple hardware and software for servers is comparable to PC packages.

Appleshare servers will not die, Wohnoutka said. Dan Kittay, manager of microcomputer networks at the New York State Bar Association, is one reason why.

USING PC SERVERS for Apple networks is not a perfect solution.

Kittay runs about 50 Macintoshes and one Appleshare file server. He said he plans to bring up some PCs and network them soon, but other than electronic mail, the Bar Association will segregate them.

"Sometimes you end up missing something" when you mix the systems, Kittay said. He added that from his perspective, "the connectivity's not been proven."

Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn., said administrators like Kittay are the minority that will keep Appleshare servers alive. They will use Appleshare to shepherd Macintoshes that need more than their inherent peer-to-peer capabilities. He predicted that most managers will make Macintosh networks just another part of their heterogeneous networks that can be managed by PC-based software.

However, using PC servers for Apple networks is not a perfect solution, many said. While it gives administrators one less machine to worry about, it still means having to develop and maintain applications for disparate systems.

That last point leads everyone to look expectantly toward the fruit of Apple's alliance with IBM. That, several sources said, could put the last piece of the connectivity puzzle in place, perhaps ultimately either elevating Appleshare Server or making it obsolete.

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Video/Gray Scales	VGA/16	VGA/16	VGA/32	VGA/32	VGA/64	VGA/64
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POWER FROM A NEW PERSPECTIVE. YOURS.

E-mail line gets a boost

BY ELISABETH HORWITT
CW STAFF

WAYNE, Pa. — Soft-Switch, Inc. has made several announcements aimed at enhancing the ability of its electronic mail gateway and directory products to integrate multivendor E-mail systems.

New versions of the company's Mail Monitor software add support of IBM's Distributed Office System and Officevision E-mail offerings, Soft-Switch said. Mail Monitor provides a centralized platform for monitoring multivendor E-mail networks.

Soft-Switch also announced that it is adding three additional protocols to its Directory Synchronization Protocol, which enables different E-mail systems to share information about the addresses of their users. Soft-Switch announced that it has licensed Retix Corp.'s CCITT X.500 suite for inclusion in Soft-Switch's directory-based products to be released in 1992.

In addition, the vendor announced that its directory offering will support IBM's Enterprise Address Book, which is the computer vendor's product for providing E-mail directory services on its Officevision platforms. Through Soft-Switch's directory Synchronization/EAB product and its other directory products, users will be able to propagate IBM directory entries to directories from Wang Laboratories, Inc., Digital Equipment Corp. and other vendors, Soft-Switch said.

Soft-Switch also said it will work with Retix, DEC and other vendors to implement the Directory Exchange protocol, which is designed to synchronize directories in the CCITT X.400 environment.

Also announced was the beta-test shipment of the Soft-Switch Network Application Programming Interface Client Library/ CICS. The offering is said to allow IBM CICS applications to send and receive mail using a remote procedure call-based interface that operates in a client/ server environment.

Parallel network database access on tap

BY JIM NASH
CW STAFF

Typically, if you want to link many personal computer users to a central database, you give employees terminal emulation software or distribute the database over several file servers. Those options, however, either negate a PC's virtues or create management headaches.

Industry observers are watching with interest the development of parallel network access to a relational database. Novell, Inc. recently announced a version of its Portable Netware network operating system that will allow up to 1,000 concurrent database queries on a Sequent Computer Systems, Inc. Information Server.

What most often looks like a single-file line of queries from PCs to relational databases can now be likened to a full frontal assault. In Netware for Information Server, Sequent and Novell have "parallelized" the transport protocols. The software now shuffles arriving network packets to the next available Intel Corp. I486 chip.

That, said an administrator who saw Information Server and the jointly developed Netware for Information Server, should pay off with faster transactions without necessitating the use of dumb terminals and distributed databases.

"Novell's [Portable Netware] software was written to run [queries] one at a time into a database," said Joe Mayer, assistant vice president of data processing at Federated Investors, Inc., a financial services firm in Pittsburgh. "Now it's been rewritten so that an entire network can go at a database at once."

"There's an enormous market out there for this," said Mark Freund, a consultant at Interconnect Network Consulting Group, Inc. Companies that have decided to use networks as their base of computing will be most anxious to gain the speed of multiple processing and the consolidation of databases on one server, Freund said from his Santa Monica, Calif., office.

Last month, Beaverton, Ore.-based Sequent announced its server, which it bills as a multiprocessing relational database. The server runs Netware for Information Server, which in turn works with all versions of Netware 2.0 and 3.0, according to Sequent.

Sequent's hardware supports from one to 30 microprocessors and will cost $25,000 to $2.5 million. It is expected to ship sometime in January. Information Server has about 800M bytes of internal memory and 50G bytes of disk space. "That's still 40 cents on the dollar for a [Digital Equipment Corp.] 9000-type application" doing the same thing, Mayer said.

The new Netware, which will run on Sequent's Symmetry systems as well, is expected to ship at the same time and cost $4,000 to $37,000.

"It's a scale issue," Mayer added. "They've taken departmental [client/server] computing and made it company-wide." The primary advantage Information Server offers is the ability to have one huge database for 200 or 300 users using one network operating system to connect to one database, he said.

Mayer said that today he uses terminals, terminal emulation and distributed databases to give access to 200 or so employees. They are usually responding to questions from customers who want to know how an investment fund is doing and how it has performed historically.

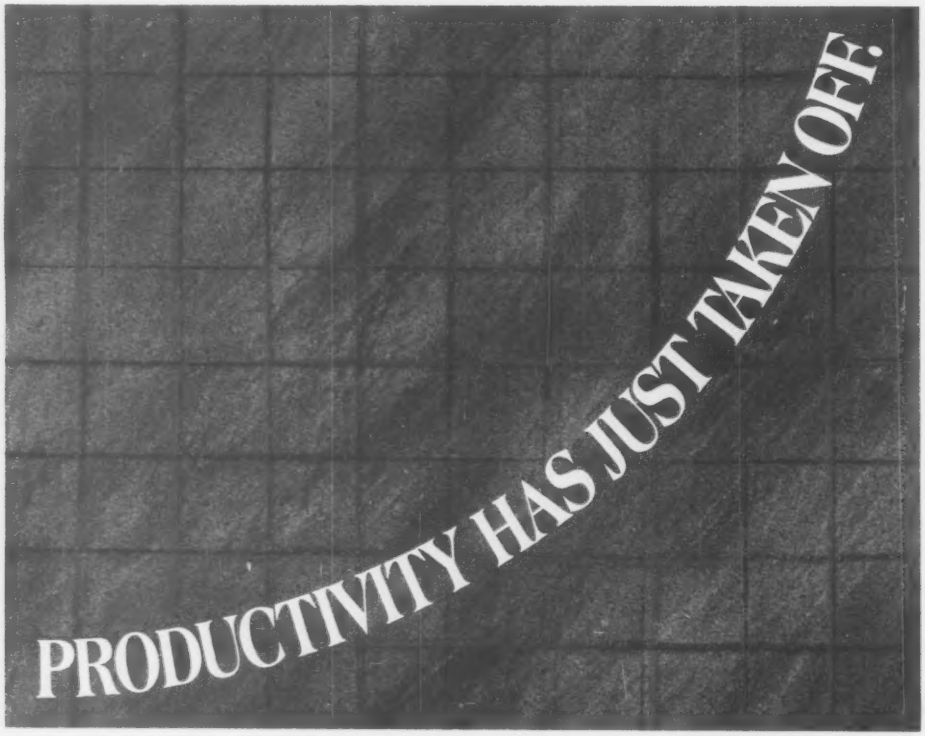
NEW DEALS

Hughes lands $2.1M contract

Hughes LAN Systems, Inc. in Mountain View, Calif., said it has won a $2.1 million contract to internetwork seven nationwide sites of **GE Nuclear Energy**, based in San Jose, Calif. Hughes is designing and implementing the internetworking network operating system infrastructure. Hughes has teamed with router maker **Cisco Systems, Inc.**, wiring hub vendor **Chipcom Corp.** and network operating system vendor **Banyan Systems, Inc.** on the project, scheduled to be completed in 1992.

ITT Hartford Insurance Group has reportedly purchased **NCR Corp.**'s Cooperation networking software and related hardware as part of an enterprise computing pilot program. The initial order of 52 workstations, five servers, 10 laptops and related peripherals has been installed, and ITT Hartford reportedly intends to leverage Cooperation to build applications that automate work-flow procedures.

Regional Bell holding company **Bell Atlantic** said it is converting electronic data interchange (EDI) customer **Crown Central Petroleum Corp.**'s suppliers to an EDI billing method through a program free to the carrier's EDI customers. The effort aims to reduce Crown Central's processing costs from 75 cents to 16 cents per invoice.



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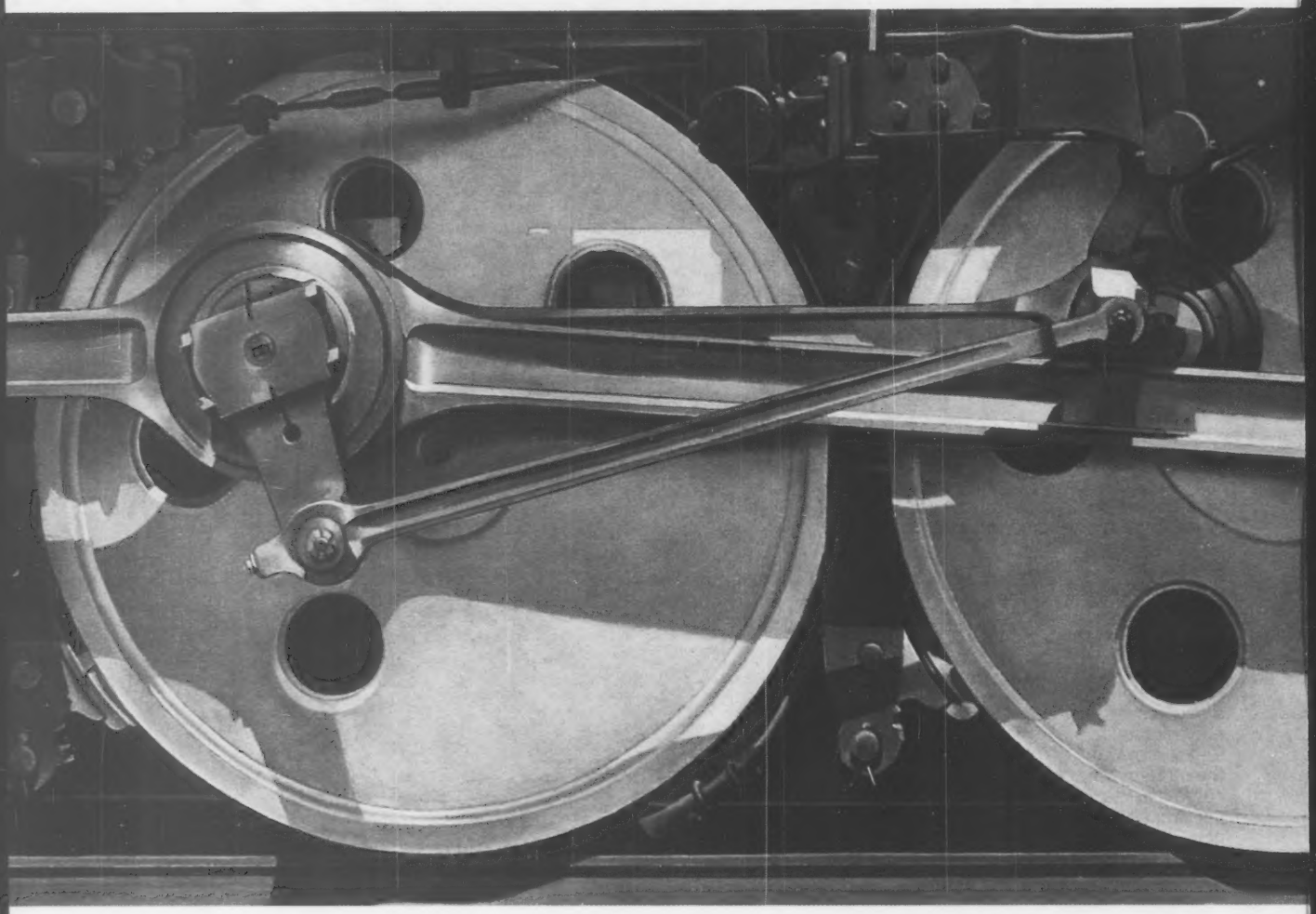

The machinery is complicat

Keeping a business on track is tough enough without having to engineer your systems yourself, especially these days.

Today's solutions are more complex, and more is expected of them. Beyond helpful, they're now "mission critical." And your choices—for vendors, operating systems, protocols and applications—have grown beyond counting.

It's enough to make rational people scream for help, which is exactly what they're doing, calling systems integrators to build new solutions and upgrade existing ones. But how do you choose a systems integrator?

We'd say the first things to look for are experi-

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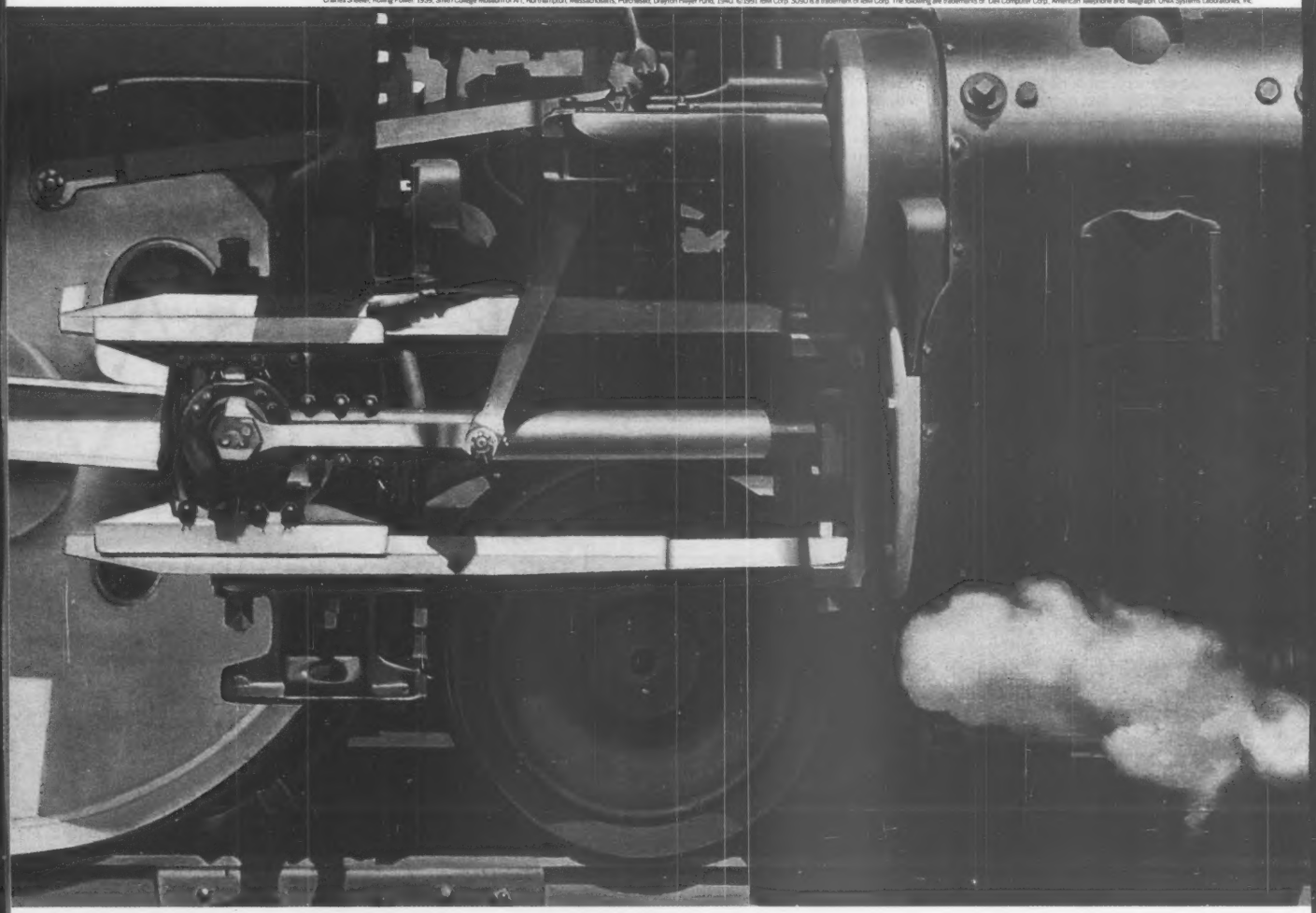

ed, but the passenger shouldn't have to worry about it.

ence and depth. Find someone who's solved your kind of problem before, for your kind of business. Someone whose knowledge of systems and software, networks and network management, from PCs to mainframes, is total.

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Again, someone like us.

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In fact, we recently automated 625 stores for Zales Jewelers, integrating Dell® PCs running AT&T® UNIX® applications, all connected to an IBM 3090™ host.

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To learn more, see an IBM marketing rep. Or to have one call you, call us at 1 800 IBM-6676, ext. 793.

IBM®

Banking services may soon be just a phone call away

BY ELLIS BOOKER
CW STAFF

COLUMBUS, Ohio — Huntington Bancshares, Inc. said last month that it will begin offering a novel form of on-line home banking to consumers next spring.

In conjunction with AT&T Network Systems and AT&T Bell Laboratories, the bank is developing an electronic home-banking platform using AT&T's Smart Phone, a telephone that features a touch-sensitive LCD screen instead of a physical keypad and a programmable memory.

Huntington — which said it expects to spend some $10 million on the first year of the project — is betting that this terminal device will make electronic home banking a success where personal computer-based products have failed.

"This is very much a telephone . . . and unlike a PC, I can picture it in the living room or kitchen," said Jeannine Kester, Huntington's vice president in charge of the new service. Kester, however, concedes the spotty history of home-banking applications.

In the early 1980s, a number of large financial institutions — possibly flushed by the phenomenal success and customer acceptance of automated teller machine (ATM) technology — launched what seemed at the time the next step beyond ATM: on-line consumer banking via PC.

But to the despair of the banking industry, these electronic services flopped. Consumers who appeared comfortable with walking up to an ATM in a shopping mall balked at the process of "logging on" to their bank over a phone line.

Analysts shared Kester's conviction that a new terminal device could hold the key this time around.

"Despite the prevalence of home PCs, only a third have modems. Besides, many people don't consider a PC a communications device," said Gary Arlen, president of Arlen Communications, Inc., a Bethesda, Md., consultancy specializing in the videotex industry.

To this, Arlen added the "resurgence" in the past three to four years in so-called "telephone bill payer" systems, voice-response systems that allow banking customers to enter an account number, check a balance and even initiate a payment by pushing numbers on their telephone keypad.

The limitation of these systems, of course, is the absence of full keyboards — for entering company names and the like — and the voice-only interface. Simply put: "People like to see words on a screen rather than hearing them read back to them," Arlen said.

Meanwhile, AT&T will not be the lone vendor of such hybrid telephones for long.

At the Telecom '91 exposition last month in Geneva, Philips Telecommunications N.V., Alcatel and Japanese electronics firm Tamura showed prototype phones that likewise can make either a voice call or a data transmission.

A final driver for the marketplace may be the recent freedom given to the Bell operating companies to enter information services.

Arlen said he suspects financial transaction processing will be one of the first information services the phone companies will target. "That's where the face-off [with the banks] could get interesting," he said.

Here's how it will work

Calls will arrive at Huntington's Columbus, Ohio, operations center over the public-switched network via either local-access or toll-free lines.

Huntington's existing AT&T System 85 switch at the operations center will route the call to a Unix-based processor. Software in this computer will route the call to the appropriate application, either on the Unix machine or on Huntington's IBM 3090/600E mainframe.

The networking and AT&T Smart Phone programming is being handled by AT&T Network Systems and AT&T Bell Labs. Unix and application programmers will be added to Huntington's 120-person development group to create the back-end services.

The AT&T Smart Phone features include a built-in speaker phone, redial, hold, time and day display and one-touch access to phone services. Its LCD screen displays a telephone keypad, an alphanumeric keyboard, as well as a variety of specialized, software-controlled panels.

Huntington plans to lease some 10,000 phones to its customers for $20 to $25 per month plus a one-time installation fee of $100.

ELLIS BOOKER

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NEW PRODUCTS

Micro-to-host

Digital Area Networks, Inc. has introduced the Maxlink VAX Knoway product for use with Banyan Systems, Inc.'s Vines.

The software product allows Vines users to process commands on a Digital Equipment Corp. VAX system without using a terminal emulator, according to the company.

One element is installed on a single node on the Vines network, and another element is installed on the target VAX system, providing host connectivity for all nodes on the Vines network.

The Knoway product is an add-on module for the firm's Maxlink VAX server software. It is priced at $1,695.

Digital Area Networks
749 S. Lemay
Mail Stop A3-165
Fort Collins, Colo. 80524
(303) 484-2400

Microrim, Inc. has devised the Vanguard series of products connecting personal computer users with databases running on Digital Equipment Corp. VAX systems.

The product line includes R:Base/V, an enhanced client version of the company's R:Base software. R:Base/V serves as a front end and connects transparently to VAX databases from DEC, Oracle Corp. and Ask Computer Systems, Inc.'s Ingres Product Division via the Vanguard Data Connectors.

Pricing for the R:Base/V client software is $995 for the first user and $995 for each subsequent cluster of five users. Connectors cost $4,995 each, according to the company.

Microrim
15395 S.E. 30th Place
Bellevue, Wash. 98007
(206) 649-9500

Cel Software, Inc. has announced Blacksmith, a software package for Apple Computer, Inc. Macintoshes.

Blacksmith allows users to develop front-end applications that work with 3270 emulation hardware from several companies. It also includes interfaces to different development environments.

The product costs $2,900 for a single-user license with two days of on-site training. Runtime versions cost $195 per user.

Cel Software
Advanced Technology Center
9650 20th Ave. #112
Edmonton, Alberta T6H 4W6
(403) 463-9090

Electronic mail

Netmanage, Inc. has created a software package that gives personal computer users access to Unix mail services.

Winmail runs under Microsoft Corp.'s Windows 3.0 environment and communicates with any Unix host on the network. A graphical user interface is provided, and messaging operations are performed through dialog boxes.

Winmail is included in the Chameleon package of Transmission Control Protocol/Internet Protocol applications based on a Windows Dynamic Link Library. Chameleon costs $400 per copy.

Netmanage
10020 N. DeAnza Blvd. #101
Cupertino, Calif. 95014
(408) 257-6404

Gateways, bridges, routers

Microcom, Inc. has announced the MBR line, a new family of bridge/router internetworking products.

The MBR/6000 supports up to three local-area networks as a local bridge and can be configured for remote support. The MBR/6500 connects LANs across X.25 networks with up to 15 virtual circuits.

The devices offer data compression rates as high as 400%, the company reported.

Pricing for the line ranges from $3,499 to $6,499, depending on the interfaces required.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000

Persoft, Inc. has extended the range of its Intersect Remote Bridge, which enables wireless connection of Ethernet local-area networks.

The bridge uses spread-spectrum wireless technology and connects LANs up to three miles apart, the company reported.

Version 2.0 also includes improved data filtering and forwarding rates. All Ethernet media are supported, including thick, thin and twisted-pair wiring.

The Intersect Remote Bridge costs

Continued on page 64

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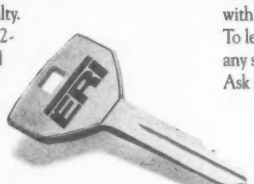

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affordable AS/400 mirroring.

*Compared to IBM Model 20.

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Continued from page 61

$6,495 per unit. One unit is required for each LAN segment to be connected.

Persoft
465 Science Drive
Madison, Wis. 53744
(608) 273-6000

Local-area networking hardware

Racore Computer Products, Inc. has announced a series of 16M/4M bit/sec. fiber-optic Token Ring adapters.

The first product in the line, the Model M8177, is a 16-bit adapter for AT-bus systems. The Model M8177 connects directly to the fiber-optic network and supports transmission distances of up to 2 kilometers.

The adapter costs $895.

Racore Computer Products
Suite 204
170 Knowles Drive
Los Gatos, Calif. 95030
(408) 374-8290

Accton Technology Corp. has introduced the Etherhub-Plus wiring concentrator.

The concentrator connects up to eight workstations to a 10Base-T local-area network without disrupting the network's operation. Multiple concentrators can be daisy-chained.

The Etherhub-Plus connects to the network backbone via an independent cable connector, preserving workstation connectors.

Pricing is set at $569.

Accton Technology
46750 Fremont Blvd. #104
Fremont, Calif. 94538
(510) 226-9800

Extended Systems has introduced the Etherflex network printer interface.

The Etherflex connects Hewlett-Packard Co. Laserjet printers directly to an Ethernet local-area network. It supports both Apple Ethertalk and Novell, Inc. Netware. The printer can be connected anywhere on the network.

The product costs $695.

Extended Systems
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

Dayna Communications, Inc. has announced the Daynaport SCSI/Link, an external small computer systems interface Ethernet adapter intended for use with Apple Computer, Inc.'s Macintosh Powerbook series of portable computers.

The adapter is available with either a BNC connector or an RJ45 connector for twisted-pair wiring networks. It can be used with any Macintosh systems that have no slot for an internal adapter.

The product is priced at $399.

Dayna Communications
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

Local-area network software

Intercon Systems Corp. has released NFS/Share Version 1.1, adding compatibility with Apple Computer, Inc.'s System 7.0.

NFS/Share is a Network File System client software package. The new version supports System 7.0 file system calls and also offers enhanced performance and status monitoring. Control of directory access privileges has also been improved.

The product is priced at $295. Current users will receive a free upgrade.

Intercon Systems
950 Herndon Pkwy.
Herndon, Va. 22070
(703) 709-9890

Customer premises equipment

Networth, Inc. has added the Enterprise Command Center (ECC) to its Series 4000 line of concentrators.

The ECC provides 10 slots, fault tolerance and multiple backplanes supporting Ethernet, Token Ring and Fiber Distributed Data Interface networks A 250W power supply is included to support high network power demands, the company said.

The ECC is priced at $3,395.

The company also announced a module for connecting its Series 4000 concentrators directly to fiber backbones.

The Fiber Module offers six ports and is priced at $2,395.

Networth
8101 Ridgepoint Drive
Irving, Texas 75063
(214) 869-1331

Systems Network Architecture

SNA Solutions, Inc. has announced LU6.2 communications for IBM midrange computers and Sun Microsystems, Inc. workstations.

Connect400 provides 5250 emulation for Sun workstations connecting to IBM Application System/400 and System/36 and 38 computers. The product provides two-way file transfer and print services and a remote Unix shell for the AS/400.

Pricing for the 5250 emulation starts at $900 for a single session license.

The file transfer, print and Unix shell options together cost $2,995 for the AS/400 version and $2,995 for the Sun version.

SNA Solutions
100 Berkeley Sq.
Berkeley, Calif. 94703
(510) 849-0741

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Initially it set the standard for 9.6 kbps, full-duplex traffic over dial-up lines. When MNP® level 5 data compression was added, throughput went to 19.2 kbps.

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The modem is particularly useful for bit-intensive data transfers, such as engineering graphics, image processing and complex financial operations. Data Rate is automatically adjusted to 9600, 4800, 2400 or 300 bps (CCITT V.32 and V.22*bis*). At the 9600 bps rate, trellis coding gives the FasTalk V.32/42b an exceptionally high tolerance for noisy lines.

For accurate communication over worst-case lines, the unit incorporates V.42 LAP-M and MNP 4 error control functions. A full complement of on-board test functions is included, and eight LEDs provide easy monitoring of the unit's operation and built-in diagnostic features.

Get acquainted with the latest winner in the UDS V.32 family. For the distributor nearest you, contact UDS at 800/451-2369 (in Alabama, 205/430-8000); FAX 205/430-8208.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Steve Milston has been promoted to vice president of information services and chief information officer at **Health Risk Management, Inc.**, a national health care information and management company in Minneapolis.

Milston had been CIO since June 1990. In his new position, he assumes the additional responsibility of IS strategic planning. He reports to Gary McIlroy, chief executive officer.

Before he was CIO, Milston was the company's director of information services.

Before joining Health Risk Management, he was a vice president at First Bank Systems, Inc., directed a five-year project for new product support at Control Data Corp. and supervised IS operations at the University of Minnesota Hospitals.

.....

Jeffrey C. Brittain, director of underwriting at **Acordia Benefit Services of Southern California** in Anaheim, has been put in charge of implementing new IS functions.

Brittain is responsible for implementing data processing and management information reporting systems and for evaluating hardware and software options for Acordia's third-party administration activities.

He joined Acordia last March to establish and manage the underwriting department. Before that, he held several management positions in group life and health underwriting with large insurers in Southern California.

.....

Brian Meyer has been promoted to vice president of customer services at **Berkley Information Services**, the Luverne, Minn.-based IS subsidiary of insurance holding company W. R. Berkley Corp. in Greenwich, Conn.

Meyer will be responsible for all product development and applications programming at Berkley Information Services.

Triumph over a taxing project

IS Director Jane Bailey's transformation of Virginia's tax systems was an inside job

BY GARY H. ANTHES
CW STAFF

This year, hundreds of thousands of Virginia taxpayers got computer-generated tax refunds within a week of filing returns. Talk about happy users — the process used to take two to three months.

The heroine of that story is Jane E. Bailey, director of information systems at the Virginia Department of Taxation in Richmond. The commonwealth's State Tax Accounting and Reporting System (STARS) has been so successful that the U.S. Internal Revenue Service, 27 states and a Canadian province have sent teams to Richmond to see if a little of the magic might rub off on their own systems development efforts.

Bailey managed development of STARS — a multisystem project stretching out over nine years — from start to finish, and her efforts won her a 1989 Award for Achievement in Managing Information Technology from Carnegie Mellon University's Graduate School of Industrial Administration and American Management Systems, Inc.

But the soft-spoken Virginia native refuses to take credit. Asked how she got the state's nomination for the award, she says, "I was just lucky, I guess."

Others are not as inclined to credit good luck for Bailey's results in the megaproject, which involved putting together 1,500 Cobol programs, 40 IBM IMS databases and 350 on-line screens in 25 applications for 1,800 users.

PROFILE: Jane E. Bailey

Katherine Lambert

Position: *Director of Information Systems, Virginia Department of Taxation*
Mission: *Managing the deployment of the multisystem State Tax Accounting and Reporting System using in-house talent*

"One key was she was able to get a lot of good people," says William H. Forst, state tax commissioner. "It was the biggest game in town, so it had a lot of attraction. But she still had to manage all those people. Coordinating everything was quite an accomplishment."

It was a challenge Bailey accepted head-on. In fact, the state's central information technology group strongly recommended that the department engage outside contractors for the job, saying Bailey's six-person staff was far

Continued on page 69

Executive retirement: Where's the backup?

BY JIM NASH
CW STAFF

Information systems executives continue to put off making plans for vacations they will not take anyway. With a few notable exceptions, it appears they are following the same strategy with retirement.

In many ways, IS executives are no different from most Americans. They give little thought to tomorrow's commute, much less to their pension two or three decades away.

However, one way in which they differ from some of their fellow workers is their habit of switching companies, negating their pension benefits in many cases.

Cheryl Currid, a former IS executive at Coca-Cola Foods, Inc., said that few of the managers she has known have given their golden years more than just a passing thought.

Now the president of Currid & Co., a Houston-based consultancy, Currid said middle-level IS types are occupationally mobile — so much so that even staying long enough to be fully vested in their company's optional retirement plan can be difficult.

In some instances, job-hopping is not a problem for retirement benefits.

Doyle Friskney, director of communications and networking at the University of Kentucky, is a member of the Teachers Insurance Annuity Association/College Retirement Equity Fund.

Friskney contributes a portion of his paycheck to the fund. His advantage is that virtually all U.S. universities offer the fund as an option. Almost without exception, as long as he works at a university, his status of payments is carried over.

"The mortality rate is high" among IS employees, said Frank Erbrick, senior vice president at United Parcel Service, Inc. Erbrick said he knows of high-turnover companies, but they usually pay high salaries almost commensurate with blue-chip consulting firms. "The employees understand the rules," he said. "They're making big bucks, and they usually invest it themselves."

"I personally feel that Social Security is not going to be much help by the time I get there, and term life insurance is too difficult to figure out," said one young IS manager who requested anonymity. He said he plans to put money into income-producing property, possibly developing housing projects in the future.

Currid said she has learned a lesson: Companies have few lifelong obligations to their employees. "We are not married. This is employment," she said. No matter what pension plan is offered at work, "saving starts at home." She suggested that IS managers take very seriously the threat of retirement on savings alone and plan accordingly.

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COMMENTARY

Thornton A. May

Discovering the New World

Throughout the current inundation of historical minutiae surrounding the 500th anniversary of Columbus' voyage to the New World, I was struck by the many parallels between Columbus and the contemporary information systems community. Columbus made a voyage of discovery and conquest; IS executives face a voyage of discovery and survival in today's uncertain technological environment.

The first parallel: Columbus didn't have a map. He had some general directions (for example, "go West — bring back riches"), executive supporters with high expectations, a trained crew and a grand design — an architectural vision, if you will. But he could not tell his key stakeholders what he was going to do, what he was going to find or when he was going to get there.

Today, the charts depicting the coastline of the New World of Cyberspace, Cyberpunks and Data Surfers do not exist in a readily transferable form. The lessons are still being learned.

> COLUMBUS MADE A voyage of discovery and conquest; IS executives face a voyage of discovery and survival in today's uncertain technological environment.

What Columbus lacked in strategic direction he compensated for with self-confidence and his demonstrated tactical capabilities as a mariner. The one fact nobody disputes is that Columbus could steer boats.

In today's environment, an increasing number of management groups are turning the task of exploring the New World of technology over to effective boat steerers — the systems integrators. The Spanish monarchs Ferdinand and Isabella basically outsourced exploration to an Italian mercenary.

The primary difference between Columbus' crew and the junior staff assigned to many system integration projects is that Columbus' crew members were already trained.

Empirical evidence from both the sailing and the systems environments documents that one's efficiency in getting from point A to point B is greatly aided by knowing where point B is. Most organizations have not articulated their point B. They know what it looks like (smaller, faster, cheaper), but they don't know how to get there.

Columbus, of course, did not reach his intended goal of the riches of the Orient, and he underestimated the costs and length of the journey, too.

In behavior reminiscent of CIOs extolling the virtues of CASE technology, he brought back some shrubbery, a few pets and some legumes, declared a monumental victory for Spain and demanded that a follow-up expedition be funded immediately. It worked. Ferdinand and Isabella increased the size of the project. (Executives never learn.) It was only after the loss of significant blood and treasure that the initiative was turned over to more prudent managers.

Based on his efforts at self-promotion following the discovery of his mislabeled continent, Columbus initially became very popular. The court in Barcelona paid homage and bestowed titles on Columbus.

However, his subsequent failure to deliver substantive and measurable benefits to the crown's bottom line ultimately led to his incarceration.

In a similar fashion, the failure of contemporary CIOs to create rational expectations, deliver measurable benefits and derive value from the New World of emerging technologies has reduced the average duration of their career tenure.

The thing about the emerging New World of technology is that the frontier is infinite. Terrestrial explorers ultimately ran out of continents to discover. But technology explorers will never run out of new platforms to integrate or new systems to build. Is it possible that we have laid the groundwork for generations of "virtual Columbus"?

Five hundred years provides enough perspective to look back on Columbus' discovery and reflect on the various lessons learned that might be relevant to the IS community today:

- There is a New World on the edge of our known technology universe.
- The process of discovery is inevitable — if we don't do it, our competitors will.
- The existence of the New World will transform existing power structures.
- The transitional period during which the rules of the Old World are adjusted to the realities of the new will be uncomfortable.
- Discovery (also known as prototyping) is not enough. The New World must be examined and then managed.

May is director of imaging research at the Nolan Norton Institute, a research branch of IS consultancy Nolan, Norton & Co. in Lexington, Mass.

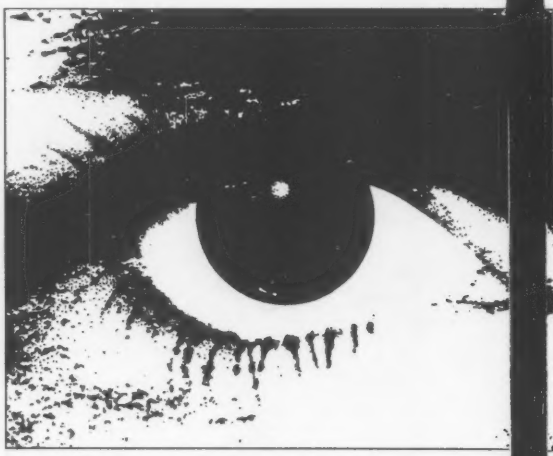
In the 70's, everyone wanted an easy-to-use relational database. They settled on Oracle. But it was slow.

In the 80's, everyone wanted speed. Sybase promised speed. But only for short updates.

Now the 90's demand both — and a lot more. An RDBMS where high performance measurements go beyond the repetitive, short write benchmarks of OLTP. An RDBMS that is truly easy to use, and designed to meet today's increasing challenges. In the 90's, businesses need OLCP (On-Line Complex Processing) — a database concept that allows you to build more complex applications, perform more complex analyses, and use more complex data in heterogeneous environments.

Which brings us to the small print.

Before you settle on Oracle or Sybase for OLCP, read the small print.



Multi-Generational Database Architecture

No other database architecture gives you the performance you need in demanding multi-user OLCP environments. Multi-Generational Architecture results in the industry's fastest response in mixed read/write situations.

INTERBASE	**YES**
ORACLE	NO
SYBASE	NO

Real-Time Event Alerters

Instantly notify any application on your network when critical data changes – without the overhead of a polling loop, or the risk of acting on an uncommitted change.

INTERBASE	**YES**
ORACLE	NO
SYBASE	NO

Triumph over a taxing project

CONTINUED FROM PAGE 65

too small and unsophisticated to overhaul the vast and motley collection of manual and batch systems in place at the time.

But Bailey, now a 25-year IS veteran at the tax department, insisted that it be an inside job. She convinced management to let her give it a try. "I felt very strongly we should do it in-house," she recalls. "Once it was developed, we would have to maintain it, and we have to be able to respond quickly to tax-law changes."

Then the hiring began, with Bailey's staff eventually swelling to 45 people. Cobol was no problem, but IMS was an unknown in the department. "IMS experience at state salaries was very hard to get," she says. But she insisted on getting first-rate people; if she could not hire the experts and specialists she needed, she retained them as consultants, then used the consultants to train her existing staff.

Database administrator Bob Hollis says Bailey was obsessed with meeting project due dates. "Jane viewed targets as hard targets. People met the first few dates, then said, 'Gee, we can do it.' It became a matter of pride after that."

There were a lot of targets over the nine years. Bailey says a major new piece of software was installed every three to six months. Users had to adapt, often getting 15 new screens at a time. Seeing user involvement as crucial, Bailey succeeded in getting six managers from user areas assigned full-time to the project.

In addition, she recruited five management analysts to redesign business processes. They also wrote user documentation and trained users, freeing the technical staff from those traditionally dreaded chores.

Bailey downplays the success of those moves. "We didn't spend enough time preparing users for change. We didn't have enough support for users." Now, 10 people out of her 40-member staff are management analysts who work full time on user procedures and issues.

Bailey kept her eyes on the top of the organization as well as the bottom, says project manager Chris Kenny, now at Blue Cross/Blue Shield of Virginia. "She did most of the interface with the tax commissioner, keeping the project in front of him," he says.

Over the years, STARS' scope has expanded to encompass more functions and more users, and its budget climbed from its original $3 million — Bailey says management believed it could really be done for $1 million — to a final figure of $11 million. "They asked for a Chevrolet, and they got a Cadillac. They didn't realize what an on-line system could do for them. Once they saw that first piece of data on-line, their eyes lit up, and they wanted more," she says.

The payoff has been impressive. STARS' users estimate that it saved the state $80 million over five years, most of it from added collections from would-be tax cheats.

Bailey joined the tax department in 1966 as a programmer trainer, having just graduated from the University of North Carolina at Greensboro. There, she earned a degree in home economics, something for which she says, "I didn't have to know anything."

That is more self-effacement, but her co-workers do not buy it. "She empowered me. She was very demanding, but she gave me the freedom to get the job done. It was the most successful thing I ever worked on," Kenny says.

Since 80% of the decisions you make are based on dynamically changing complex events — not short data updates — only the OLCP database will do. Only InterBase delivers the technology you need to handle OLCP applications.

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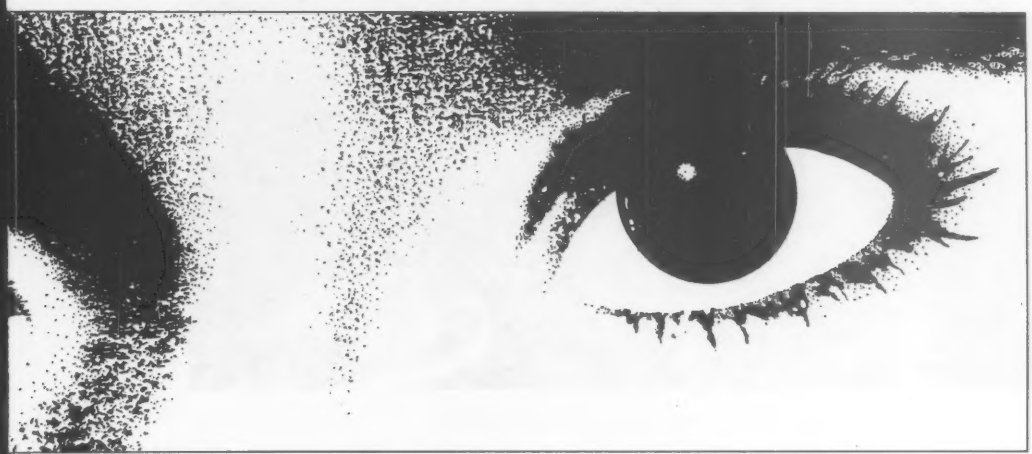

Multi-Dimensional Arrays
Handle multi-dimensional data 10 to 40 times faster than traditional row-and-column format. Arrays present the data the way your applications and users need it, for maximum productivity.

INTERBASE	YES
ORACLE	NO
SYBASE	NO

Blob Filters
An absolute necessity for dealing with multimedia (blob) data in a heterogeneous environment. Store the data once, and let blob filters translate it among platforms and applications.

INTERBASE	YES
ORACLE	NO
SYBASE	NO

Automatically Activated Two-Phase Commit
Eliminate data loss or duplication in distributed networks. Only an automatic two-phase commit ensures that all remote changes are synchronized, without pages of polling and verification code.

INTERBASE	YES
ORACLE	NO
SYBASE	NO

Modular, Sequenceable Triggers
Only triggers in the data dictionary ensure that business rules (integrity) are consistently enforced, regardless of the application. Modular triggers maximize programming productivity and reliability.

INTERBASE	YES
ORACLE	NO
SYBASE	NO

Friends in high places

Virginia Tax Commissioner William H. Forst recently got a telephone call from a Virginia resident, inquiring about the status of his pending state tax refund. But the caller was no ordinary taxpayer. He was John D. Johnson, the chief financial officer at the U.S. Internal Revenue Service.

Forst asked Johnson for his Social Security number, entered it into a terminal and had an answer for Johnson in seconds.

"John said, 'You mean, you got that at your desk just then?' He was surprised I could find out in three days, much less while I was talking to him on the telephone," Forst says.

The IRS, which is spending $8 billion to overhaul its own troubled tax systems, dispatched Chief Information Officer Henry Philcox and 10 of his deputies to Richmond to see for themselves.

Jane E. Bailey, who managed the development of Virginia's highly acclaimed tax system, met with the IRS delegation.

"They were overwhelmed; they couldn't believe we had anything like this," she says. "They were impressed at having all the information centralized and having easy access to it throughout the country. They are trying to develop the integrated system we have here as the nucleus for everything they are doing."

GARY H. ANTHES

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MANAGEMENT SHORTS

Liberty moves to outsource

Liberty National Bancorp in Louisville, Ky., has signed a short-term outsourcing agreement with **Systematics Information Services, Inc.**

Systematics will manage the conversion of Liberty's Unisys Corp.-based computer operations and applications software to an IBM 9000 series mainframe-based environment for the next three years. After that, Liberty will assume management of its own IS operation in the IBM environment.

The software license and conversion management deal were designed exclusively for Liberty, according to Roger Owens, president of financial services at Little Rock, Ark.-based Systematics. Liberty is a $4 billion commercial bank operating in Kentucky and Indiana.

The **Electronic Mail Association (EMA)** has released a 36-page corporate privacy policy guide to help companies formulate privacy guidelines for their E-mail systems. The guide deals with issues such as legal rights and obligations, systems monitoring and communication of policies to employees. The authors are attorneys David Johnson at Wilmer, Cutler & Pickering and John Podesta at Podesta Associates. The guide is available for $45 from the EMA, Suite 300, 1555 Wilson Blvd., Arlington, Va. 22209.

The latest sign of the continuing recession is the 10th annual salary survey of information systems executives in Southern California conducted by Los Angeles consultancy **Positive Support Review, Inc.** For the first time in the history of the survey, the levels of salary increases have stayed flat relative to last year and allowing for inflation.

The survey, conducted in September and October, included more than 2,500 IS jobs in more than 40 Southern California companies with IS budgets ranging from $10 million to $125 million.

Allied-Signal, Inc. and **Goodyear Tire and Rubber Co.** were the corporate winners of the Outstanding Achievement Award from the **Automotive Industry Action Group.** The award is presented annually to firms for contributions and leadership in improving the productivity of the North American auto industry.

In addition, 20 auto industry employees received individual outstanding achievement awards. The winners represent firms such as Electronic Data Systems Corp., Intermec Corp., General Motors Corp., Chrysler Corp. and Bethlehem Steel Corp. The awards were presented last month in Detroit.

Merck names Popper new IS chief

BY KIM S. NASH
CW STAFF

RAHWAY, N.J. — Merck & Co., this year's *Computerworld Premier 100* winner in the food and pharmaceuticals category, has a new information systems chief.

As vice president of computer resources, Charles Popper, formerly a partner at Deloitte & Touche, will lead Merck's effort to "fully integrate information technology into the business," according to Stanley J. Fidelman, senior vice president at Merck.

Popper will report to Fidelman.

On Oct. 1, Popper took over the spot vacated 10 months ago when Albert Cinorre retired in January. Popper earned a bachelor's degree in applied mathematics and a doctorate in computer science at Harvard University. Before Deloitte & Touche, he held executive IS positions at Shearson Lehman Brothers, Inc. and American Express Co.

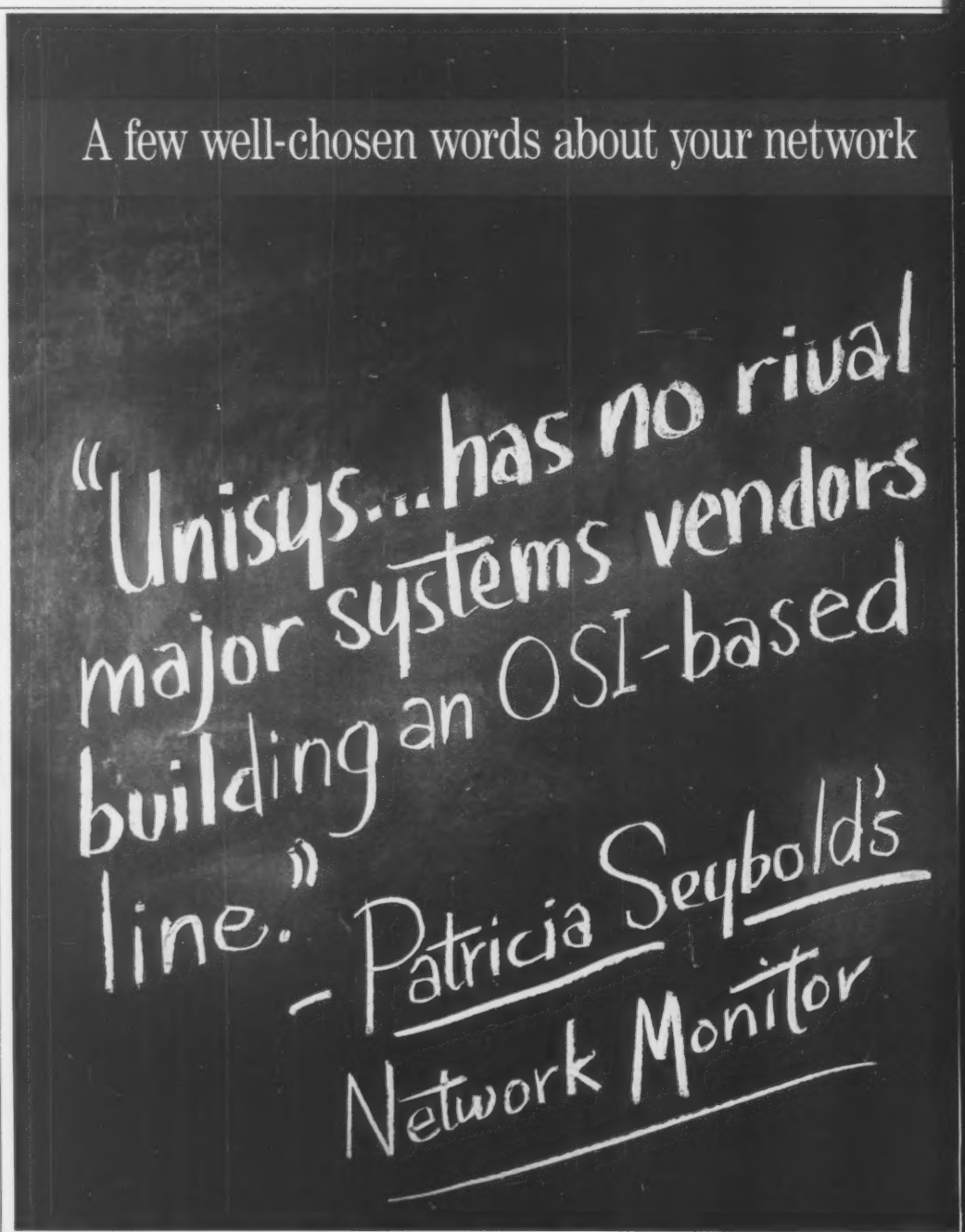
Merck, whose 1991 IS budget was $210 million — almost 3% of sales — was judged the most effective user of information technology in its industry this year, beating out New York-based Bristol-Myers Squibb Co. for top honors.

Merck raked in $7.7 billion in sales last year from best-selling drugs such as Mevacor and Zocor, two cholesterol-reducing medicines.

Fidelman called Popper's new role as head of a highly centralized 1,100-member worldwide IS staff "challenging," but he cited Popper's ability to relate technologic trends to business opportunities as key to supporting Merck's vision.

"The challenges of the next decade are great . . . and Charles is well equipped to lead," Fidelman said in an internal memo announcing Popper's appointment.

Popper was unavailable for comment.


A few well-chosen words about your network
"Unisys... has no rival major systems vendors building an OSI-based line."
– Patricia Seybold's Network Monitor

CALENDAR

NOV. 24-30

Advanced Manufacturing Research's 5th Annual Executive Conference. Cambridge, Mass., Nov. 25-26 — Contact: Advanced Manufacturing Research, Cambridge, Mass. (617) 621-1700.

Espirit Conference. Brussels, Nov. 25-29 — Contact: Espirit Conference Secretariat Commission of the European Communities, Brussels, Belgium (32 2) 236-3103.

DEC. 1-7

The Data Warehouse: Design and Implementation. Orlando, Fla., Dec. 2-3 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Image World. Miami, Dec. 2-6 — Contact: Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9093.

The Outsourcing Conference. Boston, Dec. 3-4 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Technology 2001. San Jose, Calif., Dec. 3-5 — Contact: Technology Utilization Foundation, New York, N.Y. (212) 490-3999.

Cause '91. Anaheim, Calif., Dec. 3-6 — Contact: Cause, Boulder, Colo. (303) 449-4430.

A/E/C Systems. Toronto, Dec. 4-6 — Contact: Kelly Baxter, A/E/C Systems, Chadds Ford, Pa. (215) 444-9583.

Data Concepts '91. Boulder, Colo., Dec. 5-6 — Contact: Data Storage Concepts, Boulder, Colo. (303) 444-4840.

DEC. 8-15

Document Image Automation. Washington, D.C., Dec. 9-11 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

Netcom '91. Washington, D.C., Dec. 9-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Computer Measurement Group (CMG) International Conference. Nashville, Dec. 9-13 — Contact: CMG, Chicago, Ill. (312) 527-6652.

PC Windows Exposition and Conference. San Francisco, Dec. 10-11 — Contact: PC Windows Exposition and Conference, Framingham, Mass. (508) 879-6700.

The Electronic Data Interchange Association's 23rd Annual EDI Users Conference & Exhibit. San Diego, Dec. 10-12 — Contact: EDIA, Alexandria, Va. (703) 838-8042.

Software Quality Management. Chicago, Dec. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Data '91. Miami Beach, Dec. 10-12 — Contact: International Solutions, Inc., Washington, D.C. (202) 363-8877.

Dexpo Fall '91. Anaheim, Calif., Dec. 11 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

Flat Information Displays Conference and Exhibition. Santa Clara, Calif., Dec. 11-12 — Contact: Murray Disman, Information Associates, Inc., Menlo Park, Calif. (415) 322-0247.

Excellence Through Performance. Orlando, Fla., Dec. 11-13 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Simulation Conference. Arlington, Va., Dec. 12-16 — Contact: Herb Schwetman, Austin, Texas (512) 338-3428.

JAN. 12-18

Perific Telecommunications Conference. Honolulu, Jan. 12-15 — Contact: Pacific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

The 14th Annual ATE & Instrumentation Conference. Anaheim, Calif., Jan. 13-16 —Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

Scientific and Engineering Applications of the Macintosh. San Francisco, Jan. 15-17 — Contact: Macscitech, Worcester, Mass. (508) 755-5242.

JAN. 19-25

Uniforum '92. San Francisco, Jan. 22-24 — Contact: Bob Linke, Professional Exposition Management Co., Carol Stream, Ill. (708) 260-9700.

JAN. 26-FEB. 1

The AS/400 Help Systems Operations Automation User Conference. Orlando, Fla., Jan. 27-30 — Contact: Help Systems, Inc., Minnetonka, Minn. (612) 933-0609.

Improving Productivity in Systems Development. Phoenix, Jan. 27-31 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-5929.

Comnet '92. Washington, D.C., Jan. 27-31 — Contact: Rachel Winett, World Expo Corp., Framingham, Mass. (508) 872-6700.

Windows & OS/2 Conference. San Jose, Calif., Jan. 28-30 — Contact: Stan Politi, CM Ventures, Inc., Emeryville, Calif. (510) 601-5000.

Infotext. Las Vegas, Jan. 28-30 — Contact: Infotext Publishing, Inc., Capistrano Beach, Calif. (714) 493-2434.

12th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 28-31 — Contact: Barbara Ann Cox, Office of Educational Technology (904) 488-0980.

FEB. 2-8

Information Management Conference. New York, Feb. 4-5 — Contact: The Conference Board Registrar, New York, N.Y. (212) 339-0290.

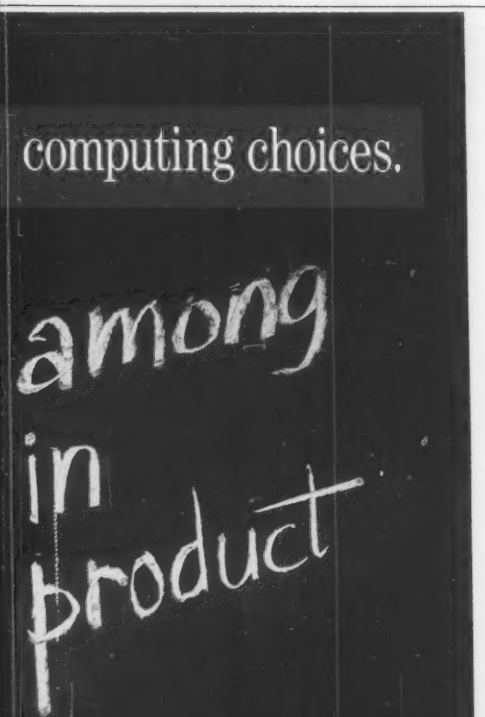
FEB. 9-15

Networld '92. Boston, Feb. 11-13 — Contact: Annie Z. Scully, Bruno Blenheim Associates, Englewood Cliffs, N.J. (201) 596-8542

Dexpo. Calgary, Alberta, Feb. 11-13 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

FEB. 16-22

Information Security Managers Symposium. San Diego, Feb. 18-20 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.



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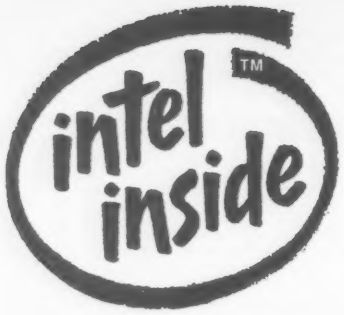
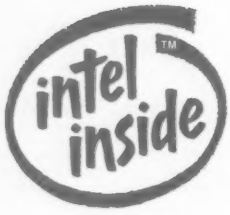
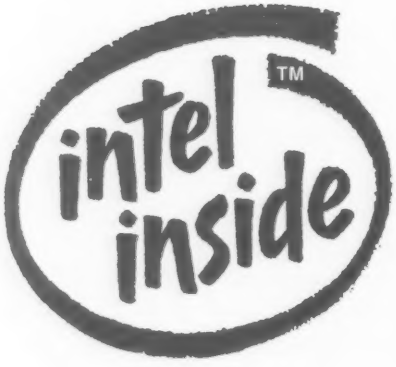
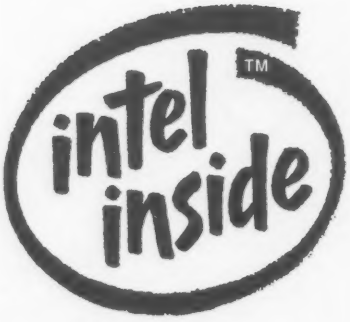
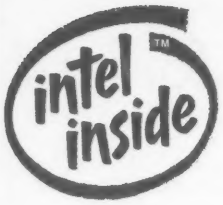


How to spot the









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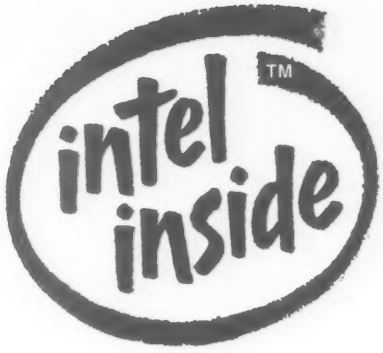

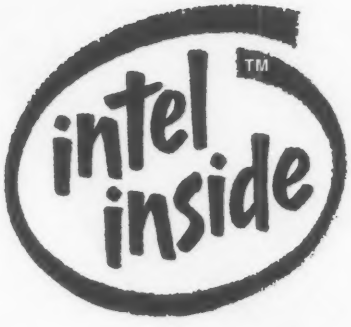

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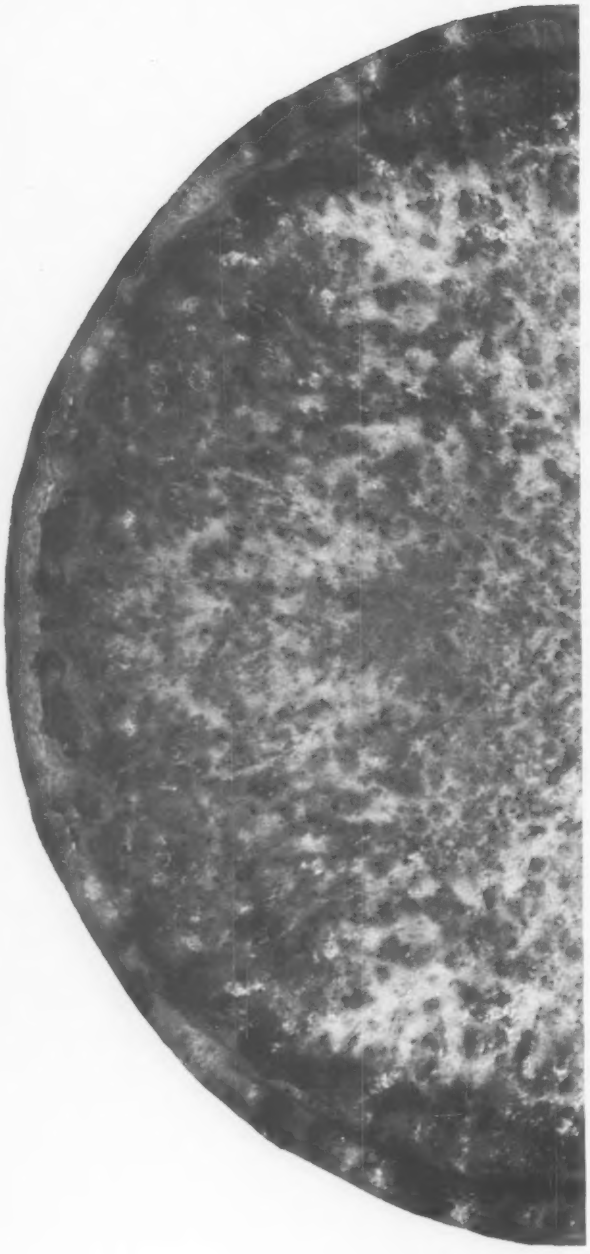

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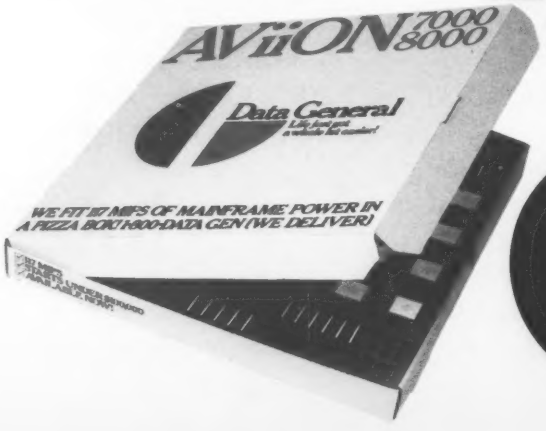

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Distributed DBMS

Many of the distributed features vendors are delivering are certainly nice to have, but users have more immediate needs they'd like addressed

BY HERB EDELSTEIN

Of all that's said about distributed databases, there's one thing you *can* be sure of: They don't exist. There is no database on the market today that enables data stored in multiple physical databases — typically on different computers — to appear as one centralized database to users and programs.

Vendors have taken some steps toward providing distributed capabilities in their database products. The trouble is, many of these capabilities are ones that users aren't particularly interested in yet, especially because the majority of users are still concentrating on more simple client/server architectures.

It's fine for vendors to forge ahead in this way, but meanwhile, more important functionality — on both the client/server and the distributed fronts — is getting pushed further and further off into the future.

An example of misplaced effort is the work vendors have invested in distributed requests and transactions, as opposed to remote requests and transactions with heterogeneous access.

Common request

In client/server architectures, clients typically request data from one database residing on one server. This type of access is called either a "remote request" or a "remote transaction" (see chart page 78). Most front-end tools today provide this capability.

What vendors are priming in their database products are more advanced access methods, called distributed requests and distributed transactions. These allow clients to send one or more SQL statements that access many servers at a time.

A distributed request comes into play when you want to do something like request a total cash-on-hand balance from multiple offices, each with its own database. The data would have to be retrieved from the various computers and added together.

In order to accomplish this, you would need a distributed database manager to decompose the SQL statement, send portions to the appropriate remote databases and then — using the responses from each — compose the result.

This requires an "optimized join," which essentially minimizes the amount of data to be transmitted from the remote databases.

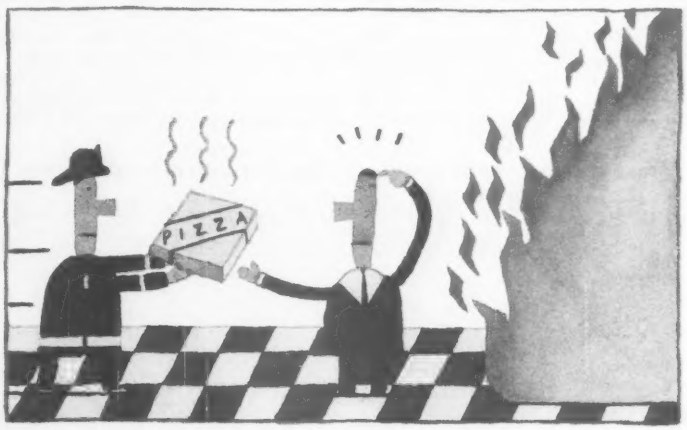
Some of the vendors that provide optimized join technology are Ask Computer Systems, Inc.'s Ingres Product Division, Informix Software, Inc., Computer Associates International, Inc. and Cincom Systems, Inc.

Oracle Corp., Tandem Computers, Inc. and Information Builders, Inc. take a more limited approach. Their systems can request specific subsets of information from remote databases (instead of entire tables), but no other optimization is performed.

No mass appeal

While it's good that vendors provide distributed optimization, it is really a feature more likely to interest the cutting-edge elite than the corporate masses, which for the most part are only accessing a single server with any one SQL statement.

The same general observation could be made about distributed transactions, which send more than one SQL statement to multiple servers. These will come in handy when people build systems that allow them to do things like transfer money between accounts at different banking offices.



James Kaczman

In this case, however, it may be good that vendors got started ahead of demand: They still have a ways to go to perfect this technology, especially in the area of "two-phase commit," which is required to ensure that the distributed database is in synchronization after the transaction.

Many vendors offer two-phase commit, including Ingres, Cincom, Interbase Software Corp., Digital Equipment Corp. and Sybase, Inc.

Two-phase commit introduces significant network activity, slowing transaction rates far below those of centralized systems. More importantly, the systems that support two-phase commit don't use the same protocol, so an application with data on different database management systems cannot do two-phase commit across them.

The fact is, the overwhelming majority of applications today do not need to update multiple databases on such an immediate basis. Most can be satisfied with the client/server model, where snapshots of the corporate database are used to periodically update local copies of data.

This is where vendors could really serve users' more immediate needs. Few products on the market explicitly support snapshot capabilities. DEC's Data Distributor does, but most other systems require the user to write the code.

There are some downsides to snapshots. For one, they create redundant data and therefore can only be used when immediate data synchronization is less important.

Another area in which people could really use help in client/server setups — and eventually in distributed setups — is in finding data that is stored on multiple servers, otherwise known as

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Edelstein is president of Euclid Associates, a database consulting firm in Potomac, Md.

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Dream Team
Imagine the perfect combination of distributed functionality. Page 81.

Product Guide
A listing of heterogeneous access tools and gateways. Page 82.

Gateway access

Whether users are working with a client/server setup or a distributed database architecture, they're going to need access to a number of different databases. The good news is, there are some access standards being developed. For instance, the American National Standards Institute and the International Organization for Standardization are working together to develop a standard for SQL 2.

Unfortunately, there are two groups standardizing connections to remote databases. IBM has proposed Distributed Relational Data Access. There is also a draft international standard for Remote Data Access for which a consortium of vendors called the SQL Access Group has created a specification.

Luckily, you can get heterogeneous access today with database gateways (see product listing, page 82). Database gateways translate the SQL from the client to that of the server to access databases with different versions of SQL, different data models (such as the nonrelational IMS from IBM) and even nondatabase management systems' file structures, such as DEC's RMS or IBM's VSAM.

Some notable gateways include Sybase's Open Server and Micro Decisionware, Inc.'s Database Gateway — which provide remote procedure calls — and Ask's Ingres Product Division's Ingres/Gateways, which provides access to a large number of databases.

The company that provides connectivity to perhaps the greatest range of DBMSs is Information Builders, Inc. and its EDA/SQL. This breadth of interfaces contributed to IBM making EDA/SQL the basis for the Information Warehouse connectivity to heterogeneous data (see story page 79).

EDA/SQL supports remote requests, remote transactions and distributed requests (albeit without distributed optimization), but it does not support distributed transactions.

HERB EDELSTEIN

Distributed

FROM PAGE 77

location transparency. Vendors support location transparency to varying degrees. The most sophisticated method is to use a distributed dictionary with a system catalog that tracks data locations, such as those found in Ingres' Star, DEC's CDD/Repository and Information Builders' EDA/SQL.

Less sophisticated

Other vendors provide somewhat more primitive mechanisms. For instance, Oracle requires the system administrator to define a synonym for a table that includes a path name, and the application uses that synonym to identify and locate data.

Another method is for the application to open a database, and a distributed file system maps the table names into physical files and their locations.

Beyond locating the data, users with client/server systems also need to be able to access data when it resides on multiple servers. Heterogeneous access tools provide this capability, but database standards would really help here (see story at left).

For the future, vendors are going to have to get beyond distributed request and distributed transaction simply to get people interested in distributed databases. The needed functionality will vary, depending on whether the user is building top-down distributed databases or federated distributed databases.

In a top-down setup, a centralized database is fragmented, and the fragments are located on a variety of computers and remote DBMSs. The distributed DBMS needs to make this data appear to users and programs as if it were all located in one centralized database.

An example of this might be a sales order system in which a company builds a database at each field office to maintain information about salespeople, products and customers. The database tables for salespeople and customers are divided into different rows by office — called horizontal partitioning — and are located at the appropriate remote database. The product information is duplicated at each site, otherwise known as replicated data.

Barriers to be faced

The first problem an application developer would run into when implementing this distributed setup is that few, if any, of the major distributed DBMSs fully support partitioned or replicated data. It is up to the application code to deal with many of the problems of reading and updating the data.

The second problem comes from the remote databases having little local autonomy, since the data structures were dictated by a central database. Local

Types of database access

Most people still need to access just one database with one or more SQL statements

Client/server	Number of SQL statements issued	Number of DBMSs accessed
Remote request	1	1
Remote transaction	1 or more	1
Distributed		
Distributed request	1	1 or more
Distributed transaction	1 or more	1 or more

Source: Euclid Associates

CW Chart: Michael Siggins

Database management systems with distributed functionality

Vendor and product	Horizontal fragmentation	Vertical fragmentation	Replicated data	Snapshots	Domains or user-defined data types	Stored procedures	Database triggers	Distributed data dictionary	Two-phase commit	Distributed join optimization
Cincom Systems' Supra				●	●	●		●	●	●
Cognos' Powerhouse Starbase					●	●	●		●	
Computer Associates' CA DB:Star	●		●		●			●	●	
DEC's RDB/VMS	●		●	●	●		●	●	●	
Gupta Technologies' SQLbase	●			●		●			●	
IBM's DB2, SQL 400, OS/2 Extended Edition DBM, SQL/DS					◗	◗		●		
Informix's Informix-Online, Informix-Net, Informix-Star			●							●
Ingres' Ingres/Intelligent Database			●	●	●	●	●	●	●	●
Borland/Interbase Software's Interbase			●		●		●	●	●	
Progress Software's Progress								●	●	
Revelation Technologies' Openengine 1.0	●	●			●	●	●	●	●	●
Software AG of North America's Adabase/Adanet	●		●	●				●	●	●
Sybase's Sybase SQL Server			●		●	●	●		●	
Tandem Computers' Nonstop SQL	●							●	●	◗

Half circle indicates partial. The companies included in this chart responded to a recent survey conducted by *Computerworld*. Oracle chose not to respond to this chart.

CW Chart: Marie Haines

users may set up a local database with their own data structures and thus duplicate portions of the distributed database.

A more pressing need in many organizations is for federated databases. This occurs when many different databases already exist at various sites, and users and programs want to treat these databases as if they were a single centralized database. Like top-down distributed databases, this kind of "bottom-up" distributed database requires a layer of distributed database software.

However, some of the functionality required will be different. For example, because the database tables already exist, there is no need to partition tables; rather, you need to assemble a logical distributed table from existing parts.

This is a very difficult problem to solve because the local autonomy has likely introduced variations in the local data definitions.

For example, it is quite possible that each office will have chosen different computers and DBMSs. Even the names for some tables and columns may differ. Units of measure (such as the weight of a part) may be recorded in kilograms in one database and pounds in another. Compensation may be in U.S. dollars in one database and Canadian in another.

No product can or even could automatically handle this kind of variation, although tools such as remote procedure calls are a major help to the application builder addressing the problem. Sybase's Open Server, Micro Decisionware, Inc.'s Database Gateway and Information Builders' EDA/SQL provide this mechanism.

Additional accommodations

Some other types of heterogeneity that a distributed database must accommodate include the following:

- **Different data models**, including relational, hierarchical and network file access.
- **Different system operation** in areas such as concurrency control, transaction processing, recovery and privilege control.
- **Access language variations** such as different SQL dialects.

On the hopeful side, the DBMS vendors are in the midst of making major changes to their products.

True distributed functionality is still a few years off, but in the next six to 18 months, major new releases from DEC, Ingres, Oracle and Sybase promise to raise the level of relational DBMS and distributed DBMS technology. Borland International, Inc.'s entry into the DBMS market with Interbase will add further competition.

However, one caveat remains: Let the buyer beware.

This is a difficult technology to build, and ensuring that all the parts work together properly is a daunting task. •

Ultimate engine

The ultimate distributed database engine would be able to provide all of the capabilities listed below. Of the products available today, many do a reasonable job on the first and second items, but few do an adequate job on the rest.

- ✓ Transparent access to data, regardless of location and movement.
- ✓ Access to DBMSs with different data models and SQL dialects.
- ✓ A distributed database catalog from which the user can see what entities are in the distributed databases.
- ✓ Replicated data support.
- ✓ Easy-to-use snapshot capability.
- ✓ A mechanism for dealing with semantic differences.

HERB EDELSTEIN

Distributed terminology

▸Types of database synchronization:

Extract databases: Copies of data taken from a central database and distributed to secondary, remote databases. They are synchronized whenever a new extract is executed.

Replicated data: Data that is duplicated in multiple databases and synchronously updated.

Snapshots: Extractions of data taken from a source database at a particular point in time and periodically updated from the source.

No effort is made to keep the different databases in constant synchronization. Snapshot data is not updated locally.

▸Types of fragmentation:

Horizontal fragmentation (or partitioning): A table is broken into multiple tables by rows. The inverse of horizontal fragmentation is the "union."

Vertical fragmentation (or partitioning): A table is broken into multiple tables by columns. The inverse operation of vertical fragmentation is the "join."

▸Types of transparency:

Location transparency: Users and programs work with fragments, but they do not need to know the location of the fragments.

Fragmentation transparency: A table that has been fragmented will appear as a single table to users and programs. The user works with global relations.

Replication transparency: Users and programs are unaware of data duplication. Duplicates of fragments will be automatically updated.

Key points of interest about IBM Information Warehouse

BY JEFFREY B. TASH

For some people, IBM's Information Warehouse announcement may amount to no more than what's become known as "YAFI" — yet another framework for integration. This new environment does not embody all aspects of distributed database technology, and what is actually available now is very different from what's being promised for the future.

Still, even in its present form, the Information Warehouse is the most comprehensive effort ever undertaken to increase interoperability and improve access to heterogeneous distributed data.

END GOAL IBM says that when the Information Warehouse is completed (which won't be for years), it will allow access and retrieval of information stored in every file and every database throughout the enterprise. Coupled with access and transport mechanisms to automate the transfer and movement of distributed data, it will also provide a framework for describing an organization's data assets.

Think of it as a "data view" companion to IBM's Netview. Netview's job is to collect, manage, access and integrate all of the information about the physical devices and resources throughout the enterprise, such as systems, networks, printers, files, applications and users.

Information Warehouse's role is to define, manage, transport and access the vast amounts of data scattered across the enterprise and will describe the following:

- What data exists.
- What data names mean.
- Where data resides.
- How often it's collected.
- How it's formatted.
- What aggregations, transformations and calculations are performed.
- How data is extracted, propogated and transferred.

This meta data (i.e., data about the data) is the end user's data dictionary.

To help in building the Information Warehouse, IBM recruited two International Alliance partners, Bachman Information Systems, Inc. and Information Builders, Inc.

INFORMATION BUILDERS' ROLE The most immediate benefit to come out of the announcement is the fact that Information Builders' EDA/SQL will serve as a data gateway.

For years, Information Builders' Focus has been able to access dozens of data formats on numerous hardware platforms and transport across multiple networks. Now that the company has made these capabilities available to other vendors, its EDA/SQL product makes almost any data in the enterprise accessible in read-only mode.

Using standard SQL, it's now possible to retrieve and even perform relational joins against heterogeneous data stored in virtually any format and located on any system. For example, a Lotus Development Corp. 1-2-3 user could join an Oracle Corp. table on a VAX with an IMS segment on a host and place the resulting data into a spreadsheet on the personal computer.

EDA/SQL supports read-only access to dozens of database and file systems, including IBM's DB2, SQL/DS, IMS, DL/1, VSAM, OS/400 DBM and OS/2 DBM; Computer Associates International, Inc.'s CA-IDMS and CA-Datacom; Cincom Systems, Inc.'s Supra, Model 204; Teradata Corp.; Oracle Corp.; Sybase, Inc.; Ask Computer Systems, Inc.'s Ingres Product Division; Digital Equipment Corp.'s RDB, RMS and C-ISAM; and Borland International, Inc.'s Dbase.

Moreover, EDA/SQL also provides full read and write access and support for remote units of work to any SQL-based product.

Another very powerful feature offered by Information Builders is its EDA/Dynamic Extender for DB2. Using this facility, any tool that can talk to DB2 can now front-end virtually every other relational database management system using Dynamic SQL.

BACHMAN'S ROLE Bachman's role is to define the "meta meta data" — that is, the data about the data about the data. It is responsible for developing the information models for all of IBM's frameworks, including AD/Cycle, Systemview and now, Information Warehouse.

Basically, the repository is a multifaceted description of shared meta data that serves many different audiences, including application developers, system administrators and end users.

HOW TO PREPARE A major problem in getting started with Information Warehouse is figuring out how to inventory what data currently exists. Most organizations are saddled with heaps of incompatible and inconsistent data definitions. Unfortunately, IBM's announcement offers little guidance on how to clean up that mess and capture consistent data definitions.

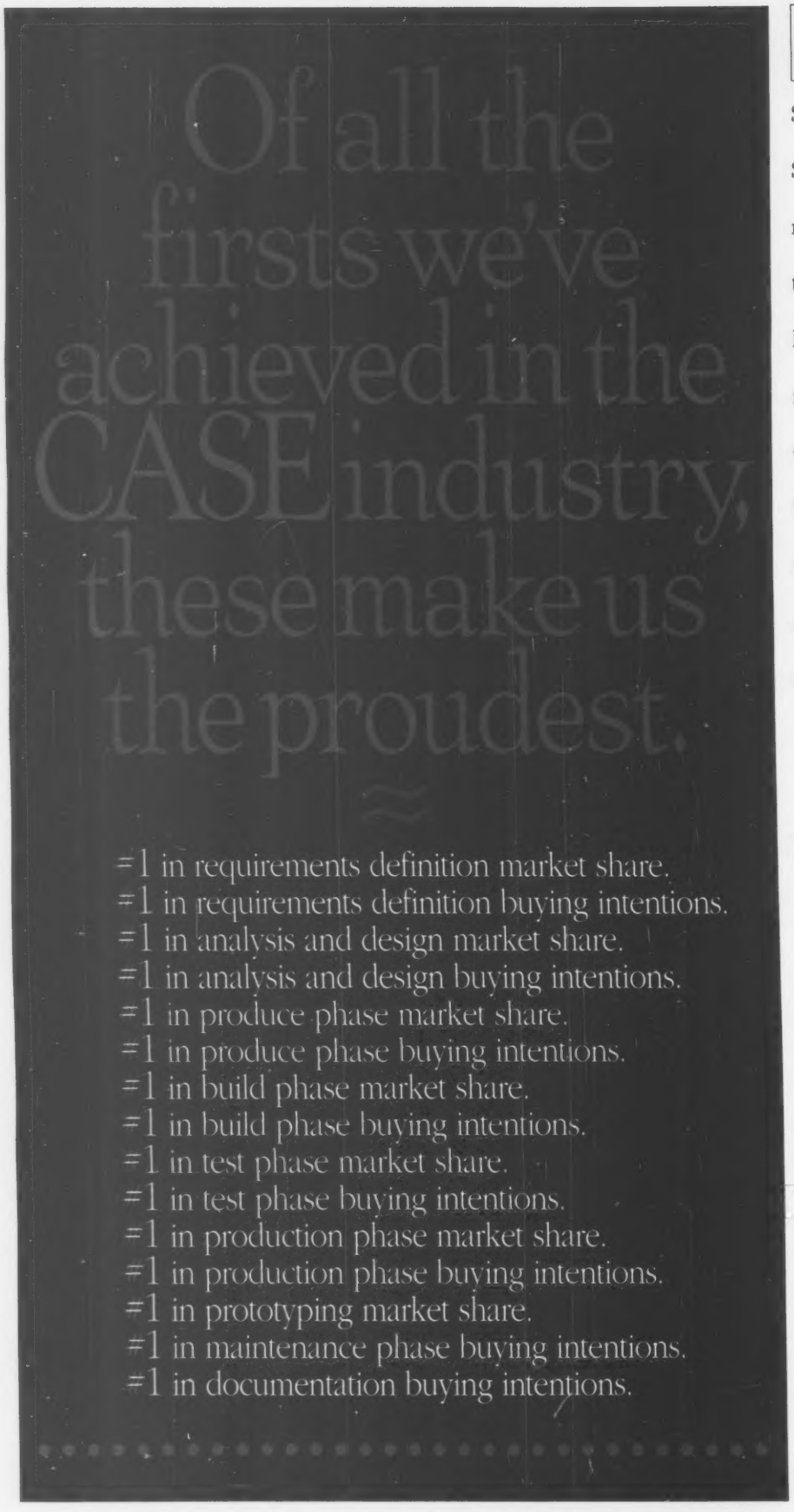
My recommendation for how to prepare for this new environment is to begin building a data dictionary that focuses on the semantic textual definitions that describe existing data assets.

The true understanding of what data really means is scattered throughout the organization in the minds of a widely dispersed group of users. Tools are needed to help capture and disseminate their knowledge.

The first step is to define narrative descriptions, possible through an interactive forum, where semantic definitions of data terminology can be read and commented on through end-user annotations. You can use an electronic bulletin board similar to the types of applications that are commonly built using Lotus' Notes.

THE FUTURE It's going to take many years before a stable, robust Information Warehouse information model gets defined and fully populated. It will be a slow evolutionary learning experience as IBM and its partners grapple with how best to describe corporate data assets. •

Tash is president of Database Decisions, a division of Hewitt Associates in Newton, Mass.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DREAM TEAM

BY PAUL HESSINGER

Imagine this: A chief data architect has just been given the go-ahead to assemble a team for a distributed database system. He doesn't have to worry about compatibility or the chance that the products won't work. All he has to do is match up his idea of the needed components with the vendors and products of his choice.

Although the data architect is unable to find the perfect match in every case and finds he's got some holes yet to fill, he starts by recruiting the following players:

▸**Data Warehouse:** Simply put, serves as primary source of data storage, with some inventory control.

Player: IBM's DB2 makes sense here, with the firm's seven-year investment in it. It appears likely that IBM will add object-oriented extensions to DB2, which will provide sophisticated inventory control. At the same time, the influence of Computer Associates International, Inc. and Digital Equipment Corp. cannot be underplayed.

▸**Enterprise Directory:** Provides more comprehensive inventory control, defining where the data is, organizationally and physically.

Player: The data architect knows object-oriented concepts and technology will be important and so plans to investigate Versant Object Technology, among other vendors.

▸**Meta Data Modeler:** Transparently analyzes "data about the data."

— **Meta Data Retrieval Tool:** Provides a window into the enterprise data dictionary, providing architectural templates that suggest valid, authorized designs and views of the data.

— **Blueprinting Facility:** Allows business users to graphically customize the templates and describe the data requirements.

Player: Bachman Information Systems, Inc.'s Model Driven Development philosophy and powerful modeling tools make it a key player for the meta data modeler. It is hoped that Bachman will continue addressing the need for graphical definition and specification facilities.

▸**Enterprise Distribution Manager and DML Generator:** Although its role appears mundane, this is one of the most important elements of the dream team. It creates the statements needed to physically access data. Statements are then routed to data servers by the distribution manager.

Player: SQL by itself does not yet fill this role, although in the long run, IBM's Distributed Relational Data Architecture will help accomplish this, at least for relational data.

Information Builders, Inc.'s EDA/SQL can play the role of virtual data server, especially since the company allows other vendors to use the EDA/SQL gateway. Apple Computer, Inc.'s Data Access Language, or DAL, will also play a role. The combination of these two players could vastly extend the reach of an enterprise data access effort.

▸**Data Server and Aggregation Manager:** The data server physically stores the data and provides all the essentials of DBMS processing. The aggregation manager collects each component of data retrieved by the distribution manager and provides a consolidated response to the original request.

Player: Sybase, Inc.'s server performance and integrated client workstations make it a solid player for this platform. Optimally, it will tie into the data distribution network so the new applications have access to existing data and provide new, valuable data to other applications.

Designated hitters: Cincom Systems, Inc.'s Supra offers distributed support for multiple platforms with strong support for location independence and recovery/restart. Ask Computer Systems, Inc.'s Ingres Product Division is strong in user-defined data types, triggers and stored procedures.

▸**Decision Support Processing:** A distributed environment must support ad hoc executive decision-making with a data pipeline that in most cases will be unidirectional, meaning the complexity of two-phase commit and other issues can be sidestepped.

Players: Comshare, Inc.'s Commander can provide an executive information system capability.

Lotus Development Corp.'s Datalens allows enterprise data to be transparently integrated into 1-2-3 spreadsheets, which provide more operational information analysis. Lotus' Notes can integrate enterprise data into the information dimension of business processes.

Teradata Corp.'s ability to support massive volumes of data with efficiency makes it a key player for processing large-scale decision-support applications.

▸**Unix Integrator.** Provides access to data stored on Unix databases.

Player: Informix-Online supports a variety of Unix platforms with an explicit distributed capability in Informix-Star.

▸**Windows Support:** Provides a Windows interface.

Player: Gupta Technologies, Inc.'s SQLwindows and SQLnetwork provide SQL integration at the graphical user interface, local-area network and server interface level. Although there would be some overlap, Novell, Inc.'s Netware SQL could also play a role. Gupta and Novell could collaborate to provide industrial-strength LAN database support.

▸**VAX Integrator:** Provides access to data stored on DEC databases.

Player: Progress Software Corp. has proved to be effective in this role.

▸**Data Network Administration Tools:** Allows the monitoring of all distributed requests so that diagnostic facilities can address problems.

Players: This is one area that no vendors currently address, although the ultimate success of a distributed database depends on this type of utility product. •

Hessinger is the chief technology officer/senior vice president of research at Atlanta-based Softlab, Inc., the U.S. subsidiary of Softlab GmbH in Munich, Germany, focusing on enterprise information technology strategies, data architectures and information engineering methods.

Firm's plan for client/server is keeping distributed in mind

BY TONY BAER

Even if you're in the midst of building a client/server architecture, it's never too early to start looking ahead at distributed databases.

That's exactly what National Grocers, Canada's second-largest supermarket chain, is doing, says Mike King, senior technology and planning specialist at the Toronto-based food retailer.

The impetus for client/server arose when National Grocers realized it needed to change from its batch-reporting system to an on-line system in order to respond faster to customer purchasing trends at individual stores.

National Grocers began to build the on-line system four years ago, constructing an executive information system (EIS) that pulled data off the mainframe and sent it to personal computers operating in terminal emulation mode. This host-based system turned out to be far too slow, requiring at least two to three minutes to pull summary reports off the mainframe.

For its next-generation EIS and operations-level decision support systems, National Grocers is going toward more distributed processing capabilities to improve performance and report flexibility. Initially, it is doing so with a client/server architecture that is limited to personnel at headquarters. When the firm goes full-blown distributed, all local stores will have on-line access to data.

WHEN THE FIRM goes full-blown distributed, all local stores will have on-line access to data.

DB2 won't go away

To build the system, National Grocers needed PC databases and related communications and server products that could operate seamlessly with DB2, the existing mainframe database. No matter how much National Grocers decides to downsize in the future, DB2 will still be there, running strategic corporate business applications or functioning as a repository for enterprise business rules.

Baer is a free-lance writer based in New York.

Because of the company's plans to extend database access to the store level, King decided that anything he purchased would have to offer a variety of interfaces.

King chose Gupta Technologies, Inc.'s product suite, including the SQLnetwork mainframe gateway; SQLgateway at the PC local-area network server level; SQLbase database server; and SQLwindows fourth-generation application builder, which runs on top of Microsoft Corp.'s Windows 3.0.

A factor in Gupta's favor, King says, was its commitment to support upcoming distributed data management enhancements promised by IBM for DB2. But the deciding point was Gupta's broad compatibility. "With Gupta, we can communicate with Oracle as easily as we can with DB2," King says. That's critical because National Grocers is also testing the operation of Oracle Corp. and Informix Software, Inc. on PCs at several stores.

When will the company migrate to fully distributed databases? When the tools are there, King says. In the meantime, the company is testing the feasibility of a distributed system to track point-of-sale terminal data. Pilot systems are now being installed at five store sites.

According to King, a hotly debated issue is whether to operate the network with databases updating each other minute by minute or to upgrade the client/server setup, dispatching "meaningful chunks" of data (roughly 60M bytes) to the LAN or individual PCs. King says the family of Gupta connectivity products will let National Grocers cross that bridge or gateway when it gets to it. •

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Gateways and heterogeneous access tools

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	NETWORK OPERATING SYSTEM	DATABASES SUPPORTED	ALLOWS REMOTE PROCEDURE CALLS ON OTHER DATABASES	LOCATION TRANSPARENCY METHOD	ACTION TAKEN WHEN TABLE MOVES TO DIFFERENT SITE	MEANS OF MAINTAINING SYNCHRONIZATION BETWEEN LOCAL AND REMOTE DICTIONARY	SNAPSHOTS SUPPORTED	COMPILES ACCESS TO REMOTE DATABASES	MINIMUM RAM/MINIMUM HARD DISK REQUIRED TO INSTALL SYSTEM	PRICE	MAINTENANCE FEE
Ally Software, Inc. (315) 986-2249 (800) 628-8375	Ally 4GL, Tuxedo System/T	IBM PCs and compatibles, Sun Sparc, Unisys U series, IBM RS/6000	MS-DOS, SunOS, Unix System V, AIX, CTOS	SNA, TCP/IP	Oracle, Informix, Sybase, DB2, IMS, DMSii, DMS1100, MAPPER	Yes	Bulletin board in Tuxedo System/T	Naming conventions, manual modification of name server	Simultaneous update of name servers	No	Yes	4M/30M	$250 - $55,000, includes 4GL development environment	$12 - $4,200 annual fee, includes 800 number, upgrades
Andyne Computing, Ltd. (613) 548-4355	GQL	IBM PCs and compatibles, Macintosh, Unix workstations	Macintosh OS, Windows 3.0, Unix Motif	Most major network operating systems	Oracle, DB2, SQL/DS, Sybase, Informix, Ingres, RDB, Teradata, AS/400, Nonstop SQL	No	Naming conventions	Need to redefine path, automatic or manual modification of dictionary, handled by naming conventions	Periodic update, database administrator modifies data model and local workstation views	No	No	1.5M/20M	$350 per user, volume discounts available	First year free support, 15% of license fee per year thereafter, includes phone support
Apple Computer, Inc. (408) 996-1010	Data Access Language	IBM mainframes, Macintosh, VAX	MVS, VM, A/UX, VMS	Appletalk, TCP/IP	DB2, Informix, Ingres, Oracle, SQL/DS, Sybase, Teradata	Yes	Handled by DBMS	Handled by DBMS	Handled by DBMS	Yes	Yes	2M/1M	$995 - $30,000	$1,999, includes phone support, upgrades
Borland International, Inc. (408) 438-8400	Paradox SQL Link Version 1.0, 1.1	IBM PCs and compatibles	DOS 3.1 or later	Decnet, Pathworks (Version 1.0), LAN Manager, 3+ Open, LAN Server, Vines, Netware (Version 1.1 — Netware database server-dependent)	IBM database manager, Oracle, MS/Sybase, RDB/VM	Yes	Naming conventions	Runs SQL setup, which looks at dictionary	Periodic update	Yes	Yes	1M - 1.5M/1M	$495 (1.1), $395 (1.0)	Included in price; also includes phone support, Compuserve, bulletin board
Brio Technology, Inc. (415) 961-4110	Dataprism	IBM PCs and compatibles, Macintosh, Windows-based PCs	Macintosh OS, Windows 3.0	SQL*Net, Data Access Language, Sequelink, LAN Manager, Netware, TCP/IP	DB2, SQL/DS, Oracle, Sybase	No	NA	Need to redefine path	Manual	No	No	2M/Less than 1M	$345	Technical support included in price
Bull HN Information Systems, Inc. (508) 294-6000	Distributed Data Access	DPX/2	DOS 2.0	LM/X, OSI, TCP/IP, SNA	Oracle, Ingres, DB2, IMS, RDB, GCOS	Yes	Naming conventions	Handled by naming conventions	Periodic update	Yes	Yes	4M/16M	$5,000 and up	Starts at $500 per year, includes several levels of support
Clearaccess Corp. (515) 472-7077	Clearaccess	IBM PCs and compatibles, Macintosh	Macintosh OS, Windows 3.0	Depends on what network supported by extension database	Any database that can be accessed by DAL, Sequelink, SQL*Net, Open Client, including Oracle, Sybase, Informix, Teradata, HP Image, DB2, SQL/DS, Nonstop SQL, SQL/400	Yes	NA	NA	No dictionary	NA	NA	1M - 3M/NP	$460	$70 per year per workstation, includes 9-to-5 phone support, free upgrades
Dalcon Computer Systems (615) 321-9650	Alpha Micro Relational Database Connection	Any Alpha Micro machine	Alpha Micro's Amos 1.3 or later	NA	Sharebase, Oracle, Teradata	No	Naming conventions	Handled by naming conventions	No dictionary	No	Yes	4M/30M	$9,000 - $30,000	20% of license fee, includes updates, enhancements, phone support
	MAC/Free Form 7.1	Any Macintosh with 72M bytes of memory	Macintosh OS	Appletalk	Sharebase, Oracle, Teradata, XDB	No	Naming conventions	Handled by naming conventions	No dictionary	No	Yes	2M/5M	$7,500 for 8-user license	20% of license fee includes updates, enhancements, phone support
Dataease International, Inc. (203) 374-8000	Dataease 4.5/SQL Connect	IBM PCs and compatibles	MS-DOS 3.1 or later, OS/2 1.2 or later	IBM's APPC Named Pipes, Decnet, TCP/IP	MS/Sybase SQL Server, Oracle, OS/2 Extended, Database Manager, DB2	Yes	Composite local repository	Automatic modification of dictionary	Automatic update to remote dictionaries, triggered update to local repository	Yes	Yes	2M - 4M/3M	$795 Dataease 4.5, $495 SQL server connect	Six months' free phone support
Gupta Technologies, Inc. (415) 321-9500	Quest (with SQL Network connectivity software)	IBM PCs and compatibles	DOS 3.1 or later, Microsoft Windows 3.0	Any system compatible with Netbios	SQLbase Server, Oracle, DB2, Microsoft SQL, Server, Netware SQL, IBM AS/400, Informix	Yes	Naming conventions	Need to redefine path	Caching, optional local catalog	Yes	Yes	2M/5M	$495	Several levels of support, including warranty, license subscription service, hot line, evaluation service, technical training, consulting
Information Builders, Inc. (212) 736-4433 (800) 969-4636	Enterprise Data Access/SQL	IBM PCs and compatibles, 370 architecture, AS/400, RS/6000, DEC VAX, Macintosh, HP 3000, 9000, Sun System 4	Macintosh OS, MS-DOS, PC-DOS, OS/2, VM/MVS, VMS, OS/400, HP MPE/XL, HP-UX, SunOS, AIX	Netware, IBM, LAN Manager	Over 45 relational and nonrelational databases and files	Yes	Naming conventions	Redefine path	No dictionary	NA	Yes	640K/1M	$175 - $350 workstation, $20,000 - $50,000 midrange, $100,000 - $150,000 mainframe	15% per year of maintenance, includes enhancements
Ingres Product Division (415) 769-1400	Ingres/Star	DEC VAX	VMS	Decnet, SNA LU.0, TCP/IP	Ingres, DB2, IMS, RDB, RMS	No	Distributed data dictionary	Automatic modification of dictionary	Simultaneous update	Yes	Yes	NP	$600 - $63,000 single user; $1,200 - $120,000 multiuser	15% of license fee, includes phone support, update tapes for all licensed machines
Metafile Information Systems, Inc. (507) 286-9232	Metaview	IBM PCs and compatibles	DOS 3.3 or later	Novell Netware	Metaview, IBM DDM, Novell Btrieve, VSAM, Cincom Supra, any via API	Yes	Naming conventions	Need to redefine path	Simultaneous update	No	No	640K/3M - 40M	$3,500	15% of list price per year includes upgrades, on-site service
Micro Data Base Systems, Inc. (317) 447-1122	Object/1 Version 2.1	IBM PCs and compatibles	DOS, OS/2 1.2, Windows 3.0	Any, including Windows, Presentation Manager	MDBS IV, Knowledgeman, SQL Server, Oracle Server, IBM Database Manager	Yes	Naming conventions	Handled by naming conventions	Simultaneous update	Yes	Yes	3M/5M	$995 developer, $495 developer/database	$350 per year, includes support upgrades, phone support, bulletin board

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

Another Symmetrix First.

EMC's Symmetrix: First RAID-based Product To Market

September 25, 1990, Hopkinton, MA—EMC Corporation today announced their Symmetrix Series of Integrated Cached Disk Arrays. By doing so, the company is the first to introduce a RAID-based product to the mainframe marketplace. This revolutionary technology will allow users to store large amounts of data in an extremely small foot... ness higher tha... nce level...

Users and analysts alike are excited about this new development in the storage hierarchy available to mainframe users. Traditional DASD storage devices consist of large 14-inch platters. The new EMC technology redefines the standard of mainframe DASD by combing several 5.25-inch disks, wit... a board-level controller... large amounts o...

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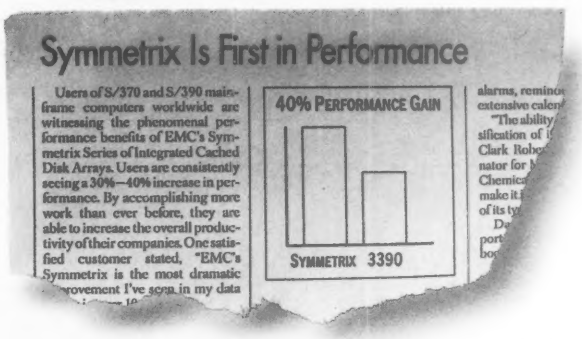

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Users of S/370 and S/390 mainframe computers worldwide are witnessing the phenomenal performance benefits of EMC's Symmetrix Series of Integrated Cached Disk Arrays. Users are consistently seeing a 30%—40% increase in performance. By accomplishing more work than ever before, they are able to increase the overall productivity of their companies. One satisfied customer stated, "EMC's Symmetrix is the most dramatic ...rovement I've seen in my data ...

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EMC's Symmetrix Celebrates First Birthday

September 25, 1991 Hopkinto... MA—Today, EMC's Symmetrix S... ries of Integrated Cached Disk A... rays is celebrating its first "birt... day". The product, a revolution... disk array device, was the f... RAID-based product for mainfra... systems to market. Symmetri... mains the only RAID-based p... available to IBM and... mainframe users. Du... year the product met... ment goals and ha... the market by st... wide are bene... uct," stated...

Symmetrix Turns One—And Only.

On its first birthday, EMC's Symmetrix Integrated Cached Disk Array (ICDA™) has a lot to celebrate. So do the hundreds of System 370/390 users gaining the benefits of Symmetrix today. In fact, the only people missing from the party are the ones who've been missing all along. Namely, the companies who keep promising the birth of their own RAID (Redundant Arrays of Inexpensive Disks) based products—but who, so far, have yet to deliver.

Our One-Year-Old Has Your Features.

Symmetrix replaces the traditional design of 3380/3390-type DASD with an array of up to 24, 5¼" disks, supported by an integrated controller unit and up to 3GB of cache, all within 5 sq. ft. This revolutionary design is the foundation of a device that revolutionizes disk capacity, reliability and environmental economy. The icing on the cake has been the 40%-60% performance improvements consistently achieved by Symmetrix customers, whether they run a 4381 or multiple 3090-600J systems.

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EMC²

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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	NETWORK OPERATING SYSTEM	DATABASES SUPPORTED	ALLOWS REMOTE PROCEDURE CALLS ON OTHER DATABASES	LOCATION TRANSPARENCY METHOD	ACTION TAKEN WHEN TABLE MOVES TO DIFFERENT SITE	MEANS OF MAINTAINING SYNCHRONIZATION BETWEEN LOCAL AND REMOTE DICTIONARY	SNAPSHOTS SUPPORTED	COMPILES ACCESS TO REMOTE DATABASES	MINIMUM RAM/MINIMUM HARD DISK REQUIRED TO INSTALL SYSTEM	PRICE	MAINTENANCE FEE
Micro Decisionware, Inc. (302) 443-2705	Database Gateway	IBM PS/2s and compatibles	OS/2	Named Pipes LAN Manager, LAN Server, Netware, Vines	DB2, other MVS, CICS data servers (VSAM, IDMS, Teradata DBC	Yes	Naming conventions	Need to redefine path	Periodic update	Yes	Yes	6M/10M	$3,495 Database Gateway, $40,00 - $80,000 Access Server for CICS, DB2	$1,690, includes free phone support, enhancements
Must Software International (203) 845-5000, (800) 441-6878	Nomad Remote Shared Database Facility	IBM 370 architecture	VM/MVS	SNA	SNA Network, DB2, SQL/DS, Teradata, IMS, IDMS/ice local access	No	Optional location parameter on database access command	Change location parameter on database access command	Maintain remote dictionary only	No	Yes	4M/NA	$10,000 - $250,000, remote access feature included	15% of purchase price, includes documentation, upgrades, support center
	Nomad Access	IBM mainframes, 80286, 80386, 1486-based systems	VM/MVS, DOS	3270 connection	All Nomad accessible on mainframe: Nomad, SQL/DS, DB2, IMS, IDMS, VSAM, QSAM	No	Local catalog	Manual modification of dictionary	Meta data materialized dynamically on local side during connection to database	No	No	640K plus 2M extender on programmable workstation/10M	$2,400 - $18,000	15% of purchase price, includes hot line support, upgrades and enhancements
Natural Language, Inc. (510) 841-3500	Natural Language	IBM RS/6000, Compaq 80386-based PCs, DEC VAX, Decstation, Sun Systems 3 and 4, Sparcstation, HP 9000, Sequent, Symmetry and Pyramid systems	VMS, Unix, Ultrix, AIX	SQL*Net	Oracle, Ingres, Sybase, RDB, Informix, Ultrix/SQL	Yes	Distributed dictionary with application	Manual modification of dictionary	Caching	Yes	Yes	8M/16M	$5,000 - $100,000	Included in purchase price, includes hot line support, consultant support
Oracle Corp. (415) 506-7000	CASE, SQL*Form, SQL*-Report-write, Oracle Mail	Macintosh, IBM, Digital, HP, Pyramid, Sequent, Sun, NCR, Netware	MS-DOS, OS/2, Macintosh, VM/MVS, Unix, MPE/XL, VMS	Netware, IBM, Vines, 3Com, DEC	Oracle, with connect products: DB2, IMS, Turbo Image, RMS, SQL/DS	Yes	Providing a distributed data dictionary	Manual modification of dictionary	Periodic update	No	No	Depends on configuration	$799	15% of license fee for standard, includes hot line for customer support, patches, upgrades, customer-related issues, on-line support bulletin
Pioneer Software (919) 859-2220	Q+E Database Library, Q+E Database Editor	IBM PCs and compatibles	OS/2, Windows 3.0	Any Windows- or OS/2-compatible network	Oracle, DB2, Sybase, SQL Server, Netware, SQL	Yes	Depends on database	Depends on database	Depends on database	No	No	640K/1M	$399 Q+E Database Library, $299 Q+E Database Editor	None
Progress Software Corp. (617) 275-4500	Progress Results	IBM PCs and compatibles, RS/6000, DEC VAX, Avion, HP 9000, Sun systems	DOS, OS/2, VMS, Unix, BTOS	SPX/IPS, Netbios, Decnet, TCP/IP	Progress, Oracle, RDB, RMS	Yes	Naming conventions, providing a distributed data dictionary	Handled by naming conventions	Caching, periodic update	No	Yes	640K/4M	$450 - $93,000	15% of license fee, includes upgrades, technical support, technical bulletin board
Revelation Technologies, Inc. (212) 689-1000	Advanced Revelation 2.11	IBM PCs and compatibles, DOS, OS/2 machines	DOS, OS/2	Vines, Netware, LAN Manager, 3Com	Microsoft/Sybase, SQL Server, Oracle OS/2 server, DB2	Yes	Providing distributed data dictionary	Need to redefine path	Periodic update	Yes	Yes	640K/8M	$1,195	Six months free, $400 per year thereafter, includes unlimited technical phone support
SAS Institute, Inc. (919) 677-8000	SAS/Access Software	IBM mainframes, DEC VAX, Data General and Prime systems	OS/2, MVS, CMS, VSE, VMS, Primos, AOD/VS	Most major networks, including Starlan, Netware, Token Ring	DB2, IMS-DL/1, IDMS/R, CA-Datacom/DB, Adabas, System 2000, SQL-DS, RDB, Oracle, Ingres, Prime Information, Dbase, Database Manager, DIF files	No	NA	NA	No dictionary	No	No	512K, 640K/NP	Licensed on an annual basis; fees based on hardware configuration	Free technical support, includes upgrades and enhancements
Smartstar Corp. (805) 685-8000	Smartstar, Smart Distributor	DEC VAX	VMS	Decnet	RDB, Oracle, Sybase, Sharebase, RMS	No	Naming conventions	Manual modification of dictionary	Manual import of data as required	No	No	2M/50M	$5,000 - $85,000	15% of purchase price per year, includes phone support, maintenance, upgrades
Software Interfaces, Inc. (717) 492-0707	SQLassist	DEC VAX, any PC that can emulate a VT terminal	VMS	Ingres Net, SQL*Net, Decnet, TCP/IP	Ingres, Oracle, RDB, Sybase	NA	NA	Automatic modification of dictionary	No dictionary	Yes	No	2M/Depends on database	$2,000 - $19,000, depending on configuration	First year free, then 30% of license fee per year, includes upgrades, technical support
Software Publishing Corp. (408) 986-8000	Info Alliance 1.1	80386-based systems and higher	OS/2 1.21, Windows 3.0	Netbios-compatible	Info Alliance, OS/2 Extended, Dbase, SQL Server	No	Naming conventions	Automatic modification of dictionary	No dictionary	Yes	No	4M/6M	$495 stand-alone, $2,495 server	$2,000 per installed server per year, includes phone support, technical tips, maintenance and upgrades
	Superbase 4 Version 1.3 with SQL Library	80386-based systems and higher	DOS, Windows 3.0	Netbios on Netware	Gupta SQLbase, Oracle, SQL Server, Sybase, XDB Systems' XDB	Yes	None	Need to redefine path, initialise new back-end channel	Periodic update	Yes	No	640K, 2M for Windows 3.0/1.5M	$695 Superbase 4 Version 1.3, $495 SQL Library	Negotiable fee for 90 days, includes unlimited phone support, technical tips
Uniface Corp. (510) 748-6145	Uniface	IBM, DEC, Mips and Compaq systems	DOS, OS/2, VMS, Unix	Decnet, Netware, NFS, TCP/IP	Basic Plus, Dbase, Ingres, Informix, Oracle, RDB, RMS, Sybase	Yes	Providing a distributed data dictionary	Need to redefine path	Dictionary synchronization is transparent to Uniface	No	Yes	2M/10M	$5,000 - $250,000	15% of license fee, includes phone support, upgrades
Unify Corp. (916) 928-6400, (800) 248-6439	Accell/SQL	Most Unix platforms, including HP, Sun, Sequent	Any major Unix OS	Netware	Unify 2000, Sybase SQL server, Informix, Oracle	Yes	Naming conventions, depends on DBMS engine	Depends on DBMS engine	Depends on DBMS engine	Yes	Yes	8M/100M	$2,000+	Support fee required for one year, includes upgrades
Unisys Corp. (215) 986-4511	Open/OLTP	U6000 series	Unix system Version 3.2, Version 4	Netware	Oracle, Informix, C-ISAM	Yes	Data-dependent routing, bulletin board	Transparent to user, manual switch by system administrator	Two-phase commit via XA protocol (X/Open)	NP	Yes	16M/20M	$3,000 - $38,000	$450 - $4,500, includes phone support, upgrades

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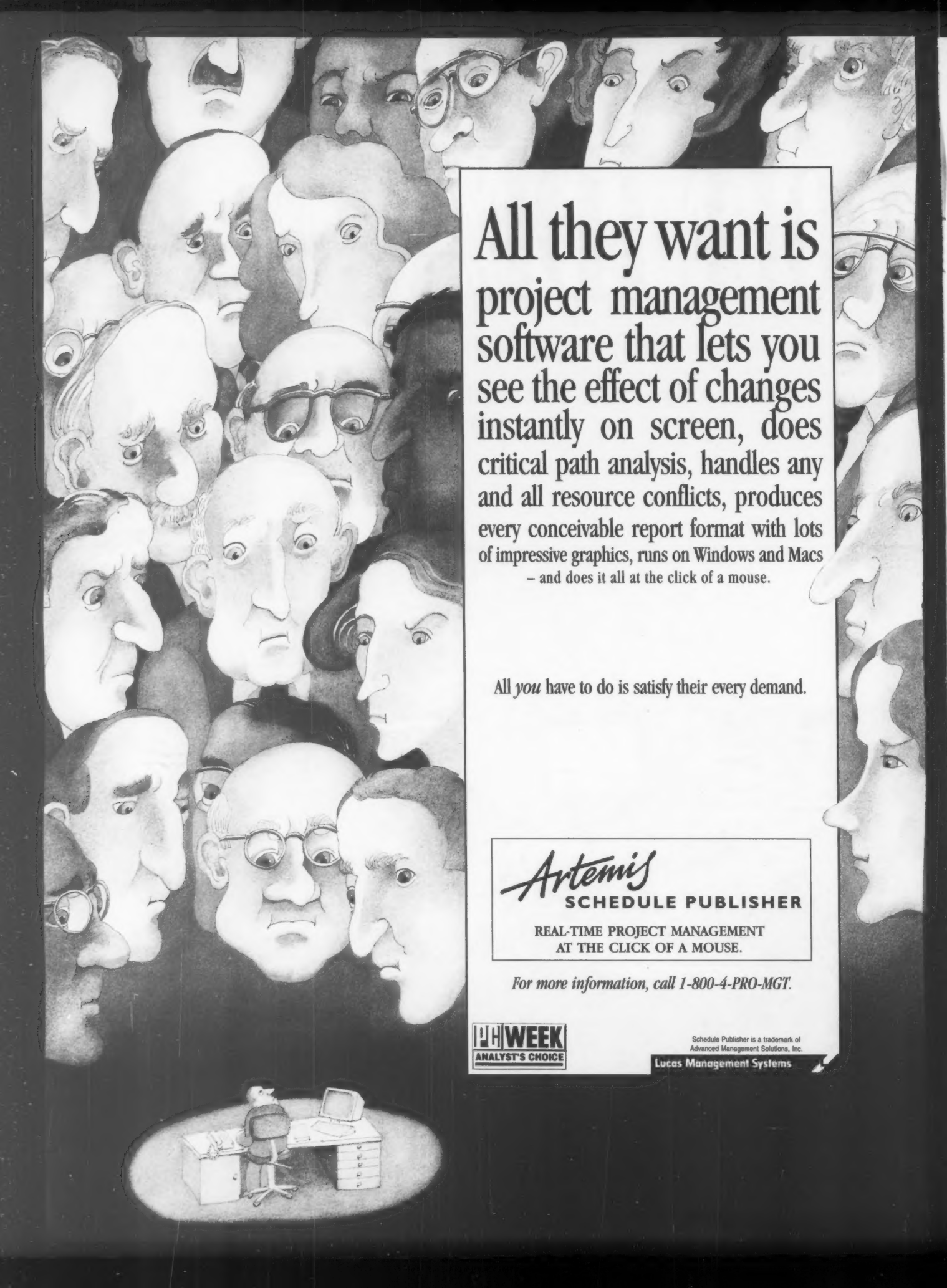
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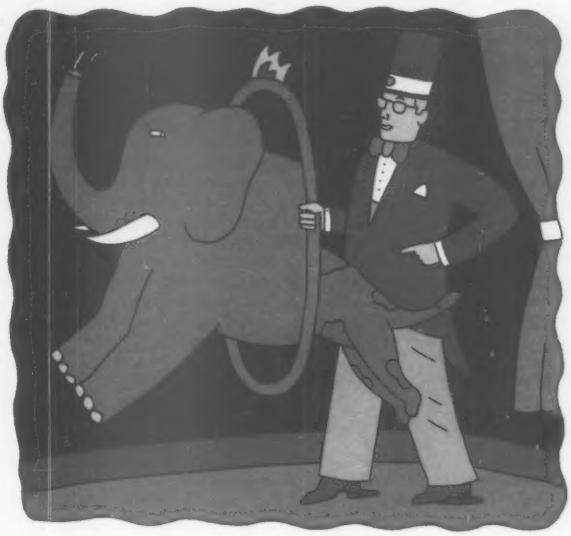
Well-handled repository conversions

Reverse engineering isn't the only way to convert CASE tools. 'Lateral engineering' — building a program that transforms specs at the same logical level — can be a better choice



Stephen Turk

BY LEE L. GREMILLION

Converting from one computer-aided software engineering (CASE) tool to another has never been mistaken for a pleasant experience.

Such a move has typically been problematic, especially for companies that have used lower level CASE tools — those that generate source programs (typically Cobol) and database definitions from higher level specifications — to build and maintain important application systems.

Because companies may have a significant investment in the application system specifications stored in the tool's proprietary repository, switching from these "lower-CASE" tools means having to convert the specification from one repository to another. While this switch is less hectic for companies converting to a tool for which conversion programs exist (see story page 92), most of the CASE user population doesn't fall into that category.

If you are in the latter group, don't despair. There is a way to make the repository conversion process easier and even cost-effective. Rather than trying to work with reverse engineering tools, which are really designed for another purpose and work at another level, think about lateral engineering — building a program to convert specifications from one repository to another.

In converting repositories, lateral engineering is much easier than reverse engineering because lateral engineering transforms specifications at the same logical level. Reverse engineering (see story page 90), on the other hand, involves moving from a lower level of abstraction (physical source code) to a higher level (logical process definition statements).

Furthermore, the cost of developing a conversion program isn't prohibitive, depending on such factors as the nature of the source and target CASE tools and repositories, the number of constructs (logical units of definition) to be handled and the skill of the developers. For example, recent cost analyses by an organization considering constructing a converter fell in the neighborhood of $200,000.

An added plus is that a converter, once created, can be used for conversions of multiple applications.

Step by step

The key actions in preparing a repository conversion

Analyze	the contents of the current repository to determine the distribution of object types it contains.
Identify	which constructs should be programmatically converted, which should be eliminated before conversion and which are best handled manually.
Construct	a program (or set of programs) to convert those specifications that appear to be amenable to automatic conversion.
Test	the entire conversion process, manual and programmatic, from end to end, preferably on a small scale.

CW Chart: Marie Haines

What is a converter?

The lateral engineering tool, or converter, moves the specifications for an application from the repository of one CASE tool to that of another. The converter needs to contain the logic to transform specifications in the source repository to their logical equivalents in the target repository. Designed as an automated program, the converter should be capable of reading the specifications from the source repository and writing the transformed specifications into the target repository.

Lateral engineering facilitates repository conversion for the following reasons:

- The specifications within a repository are complete and consistent; they are all in one form and in one place. They describe the entire system, both data structures and processing logic. All of the logic is in one common syntax.
- CASE tools use similar architectures for system definition. Most describe an application system as a collection of objects — data items, screens, batch programs, reports, logic modules and so on.

  Some objects, such as data item definitions and screen and report layouts, show only minor variations in syntax from tool to tool.
- CASE tools are heavily oriented toward relational database structures, at least at the logical level. This makes the conversion of database definition relatively straightforward. Application data conversion is simplified because the structure of the databases generated from the two repositories will be logically identical.
- CASE tools usually provide a utility for unloading the contents of their repository to a flat file and reloading it to the repository. This provides a means for backup and moving specifications from site to site.

Using these facilities simplifies the programming of the lateral engineering tool because it doesn't have to navigate source or target database (see chart page 90).

Continued on page 90

Gremillion is senior consulting manager at Price Waterhouse in Boston.

Continued from page 89

It is also easier to analyze the repository specifications once they have been unloaded into a sequential file.

The 'fun' begins

The tough part of repository conversion comes in analyzing the contents of the source repository and deciding what must be converted automatically and what must be converted manually. Companies must also discern what processing patterns and features used in their applications stem from idiosyncrasies of the CASE tool.

In terms of what to convert, it is important to note that the distribution of objects within a repository almost always follows Pareto's law, which is also known as the 80/20 rule. A relatively small number (20%) of constructs accounts for the vast majority of actual objects.

For our purposes here, one construct comprises all the variations of specification objects that would be handled in a similar fashion by a conversion program. For example, data item definitions make up one construct because all of them — whether they are in a global or local dictionary or defined in-line as working storage items — look the same.

Arithmetic statements are another construct because they share a common operator/operand structure.

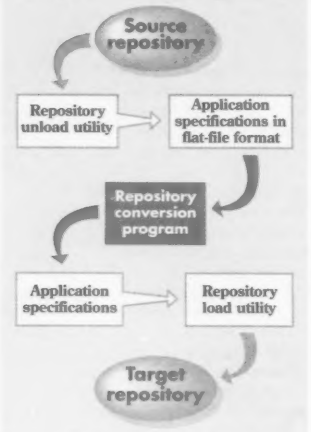
Examination of application systems in a number of repositories suggests that fewer than a dozen of the most common constructs account for 80% or more of the number of distinct objects (see chart bottom right).

This chart shows a distribution found in analyzing the specifications in repositories created by several users of one common "lowerCASE" tool. This particular tool required that data item values be explicitly moved from work areas to screen or report variables so that move statements dominate the count.

Other tools, with different approaches to data and process definition, will show different distributions in their repositories.

Travel tips

Using CASE unload/load utilities, a repository conversion tool can avoid navigating either source or target database



Source: Price Waterhouse CW Chart: Marie Haines

Obeying the law

The key to benefiting from Pareto's law is to recognize its existence in a given situation and to concentrate effort and resources accordingly. Firms can create a repository converter to handle the most common constructs first, expanding it later to handle less frequently encountered ones. At some point, the law of diminishing returns makes it easier to switch to manual conversion for some specifications rather than attempting to automate their conversion.

In fact, it may be twice as expensive to write a generalized program to convert from repository A to repository B as it would be to write a program to convert the specifications for one particular set of applications.

The key is the extent to which the specifications make use of less than the full set of features available with the repository.

To make up a construct table, companies need first to tabulate what is in the repository: types of objects and counts. For those objects that represent process definition language statements, a further tabulation by verb is useful. These tabulations are then used to guide a grouping according to specification commonality. For example, all arithmetic statements have the same basic form, with minor variations for such things as rounding and remainders.

The grouping into constructs must be guided by knowledge of both the source and the target CASE tools. The basic idea is to include in a construct all of those things that can be converted from the source to the target repository in basically the same manner.

CASE idiosyncrasies

Transforming specifications that reflect built-in processing patterns of one CASE tool to those of another can also be thorny.

For example, CGI Systems, Inc.'s Pacbase builds report programs on the notion that the program will read through a file and report on its contents. The repository specifications for such a program, therefore, consist of the identification of the file, actions to take on each record, actions to take at control breaks and actions to take at the end of the file. To convert such specifications to the repository used by a tool that does not employ the same pattern will require that the conversion tool transform the logic.

Dissimilar processing patterns will increase the difficulty and cost of creating a conversion tool. This cost of conversion would be one factor to take into account when evaluating CASE tools. As an organization evaluates new CASE tools, it should consider how closely the underlying processing assumptions match those of its current tool.

Let the building begin

Once you've decided what to take with you, the building can begin. The project of building a repository converter should be divided into three phases:

■ **PHASE I.** Create a small, sample application system that embodies the most common constructs encountered in the "real" application. Debugging a converter will take many iterations of processing and specs, including loading them into the target repository and attempting to generate the application.

Therefore, dealing with a small sample application helps cut down on the amount of time expended in processing, which can be prohibitive with a larger application. A typical pension administration system, for example, might take 24 hours to generate in its entirety. A small sample system is needed so that many iterations may be made in a reasonable time frame.

After you've created the sample system, build a converter that handles the constructs found in this sample. Make sure that the converter produces specifications that can be loaded into the target repository and used to generate a system for the target platform. To do this, one must do the following:

▶Determine the record layouts of the specs unloaded from the source repository as well as those to be loaded to the target repository. These may or may not be published by the vendor. It is not conceptually difficult to determine this mapping from the data, but it is time-consuming.

▶Formulate the transformations required to go from source to target. Some of these will be simple, such as data item

Continued on page 92

Why not reverse engineering?

The sticking point is processing logic

A great deal of attention has been focused lately on the concept of reverse engineering; that is, the process of extracting repository specifications from the source code of existing, "legacy" systems — old applications typically written in a third-generation language such as Cobol that work but are hard to enhance and maintain. Reverse engineering attempts to salvage some of the investment made in an existing system by automatically creating entries in a repository that can then be manipulated using CASE tools to create a new and better system.

Unfortunately, reverse engineering is a hard problem, and tools that make it easier are still evolving. While today's reverse engineering tools can successfully capture the data structure design of an existing system, they have a tough time processing the logic.

Reverse engineering of process logic is a formidable task for several reasons. First, overcoming the difference in language level — i.e., lifting the specifications from a third- to a fourth-generation level — is inherently difficult.

In order to succeed, reverse engineering must also overcome the following obstacles:

- Ambiguous input operations when key initialization and input commands are set far apart in the code.
- Environmental constructs that are not actually part of the application function (such as CICS pseudoconversational flow-control code).
- Multiple languages and versions of software (such as old CICS constructs).

These obstacles arise because of the need to lift the specifications to a higher logical level. The reverse engineering process must be able to understand what was intended with the key setting, pseudoconversational flow and old constructs, for example, to convert them properly.

The problem is reduced, although not entirely eliminated, if the conversion is to a language at the same logical level. In this case, the converter must merely worry about correctly reproducing the logic in the new language, not understanding what it is doing.

Much manual intervention is needed in reverse engineering if an application is migrated to a specification language significantly different from the original.

The 80/20 rule in action

Distribution of object types found in one CASE tool's repository

Construct	Typical percent of repository objects	Cumulative
MOVE statement	24%	24%
Screen/report layout item	17%	41%
CASE logic statement (IF)	16%	57%
Data item definition	7%	64%
Arithmetic statement	5%	69%
PERFORM-type statement (not part of IF)	5%	74%
Database FIND/READ-type statements	3%	77%
Database WRITE/REWRITE-type statements	3%	80%
Others	20%	100%

Source: Price Waterhouse CW Chart: Marie Haines

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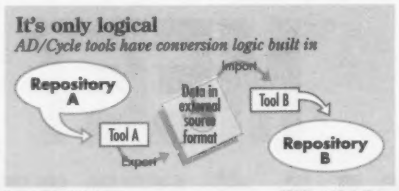
Built-in data transfer facilities ease conversion

The CASE tools designed to cooperate with one another, such as those of IBM's AD/Cycle, provide a data transfer facility based on a common interchange format (see chart at right). AD/Cycle tool users use such a built-in facility, which is still evolving, to move specs among CASE tools.

In AD/Cycle, a tool should be able to write the contents of its repository in the External Source Format (an AD/Cycle standard) via an export facility (see chart).

For AD/Cycle tools, the repository conversion logic is written into the export and import facilities.



Source: Price Waterhouse

CW Chart: Marie Haines

Continued from page 90

definitions and screen and report layouts. The most difficult transformations will involve processing logic patterns that are supported by the old but not the new CASE tool. For example, some CASE tools provide powerful date manipulation commands (date arithmetic and formatting), while others do not.

Furthermore, some CASE tools have built-in functions for extracting data to a flat file, sorting the file and then reading it back into the program, while other tools can only perform these functions by calling third-generation language subroutines.

▶Write and test the program. This program should be written in whatever language is most productive for the programmer. The language in which the converter is written is not dependent on the source or target CASE tool and repository.

ONCE YOU'VE DECIDED what to take with you, the building can begin.

■ **PHASE II.** Determine what is left in the real system that is not being handled by the converter, and decide what should be added to the program. Devise a strategy for handling constructs that will not be programmatically converted.

In general, these must either be removed from the source specifications before coding or be manually converted after the automatically converted specifications are loaded.

For example, if there are unconditional branching statements in the source, one might decide to eliminate these before conversion. If the source and target CASE tools have different ways of defining database access paths (e.g., indexes), this might be an example of specifications that are easier to key in the correct format manually.

■ **PHASE III.** Completely convert a real, but preferably small, system, including preconversion fix-up in the source repository, automatic conversion and manual entries in the target repository. Generate the system from the target repository and convert the application data. Test the application system functions to determine the correctness of the specification conversion. Debug the conversion program and manual procedures as necessary. Measure the amount of manual effort required to calibrate estimates of time requirements for subsequent conversions.

When all is said and done, a company will have converted its repository with minimum stress and maximum benefit. ●

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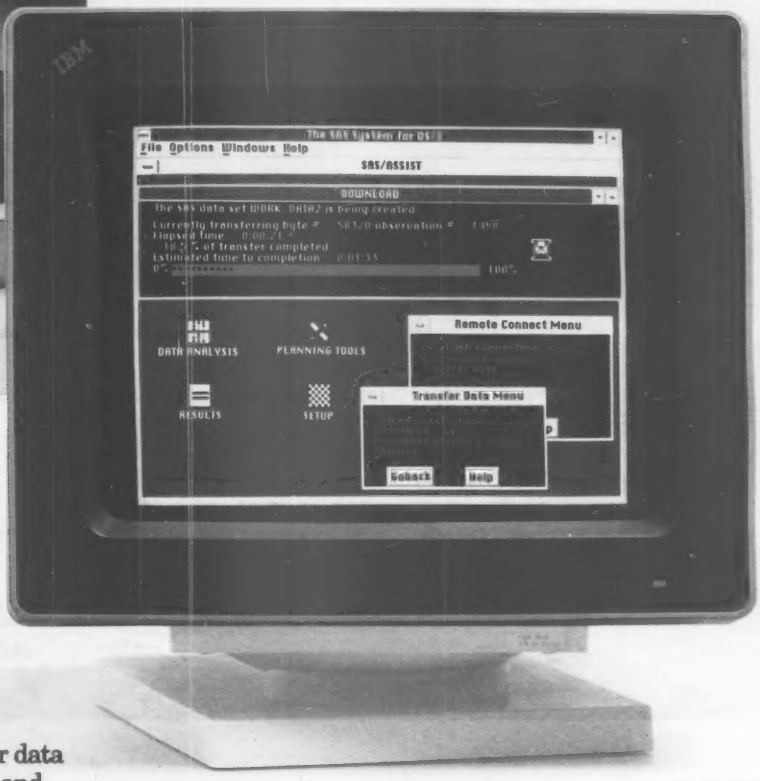

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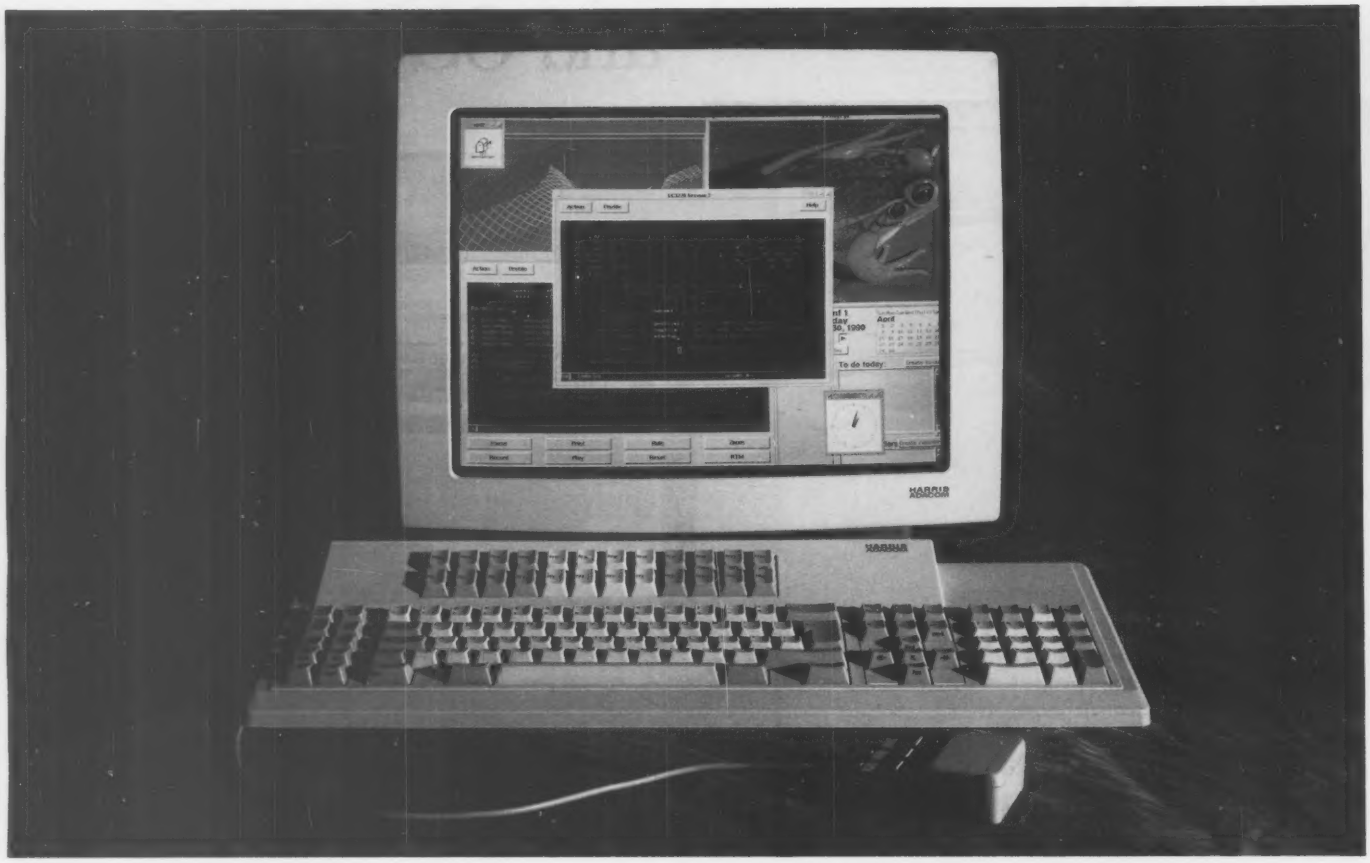

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Bank on it

▶ The 10-year outsourcing contract recently announced between El Segundo, Calif.-based **Computer Sciences Corp.** (CSC) and **General Dynamics Corp.** might be estimated at $3 billion, but early-year outlay on the vendor's part is emerging as the rule in big outsourcing deals. To finance the General Dynamics agreement as well as its recently completed acquisition of **Intelicom Solutions Corp.**, CSC last week arranged a $250 million revolving credit compact with a banking syndicate led by **Citicorp USA, Inc.**

Offer on

▶ Network-based software vendor **IMRS, Inc.** made its debut in the public market late last month at an initial offering price of $12.50 per share. Proceeds from the initial public offering of 3.2 million shares will be used to reduce the Stamford, Conn.-based firm's debt load and for general corporate purposes, including possible acquisitions, according to IMRS.

Good guys

▶ **LDI, Inc.**, a 19-year-old computer leasing firm based in Cleveland, is this year's winner of the highest ethics honor bestowed by its peers: the Computer Dealers and Lessors Association (CDLA)'s **James F. Benton Memorial Spirit of Excellence Award**. The annual award, according to the association, is presented to the third-party leasing/remarketing firm "which best exemplifies the ideals of CDLA by the manner in which it upholds the association's Code of Ethics and serves the entire business community."

Undaunted

▶ Third-party computer leasing and remarketing market leader **Comdisco, Inc.** took time off from its well-documented legal wars with **IBM** [CW, Oct. 28] last week to attend to courtship of a different stripe: The firm inked a definitive agreement to acquire the European high-tech leasing operations of **USF&G Corp.** The deal, which Comdisco said was scheduled to close within days of the Oct. 28 announcement, deepens the Rosemont, Ill.-based firm's established presence in The Netherlands, Switzerland, Germany, the UK and France.

Andersen recruits its workers to a class act

BY ELLIS BOOKER
CW STAFF

ST. CHARLES, Ill. — How does a company that bills itself as an authority on understanding and installing leading-edge information technology anywhere in the world educate its employees?

Andersen Consulting's two-word answer might be "structured training."

The Chicago-based systems integrator, noted for its nearly religious belief in "methodology," spends a small fortune each year training its worldwide staff of 21,000 consultants. In 1990, it spent 8.3% of its $1.875 billion revenue on training and training support.

Andersen's St. Charles *training center, which can house more than 1,700 and has over 1,000 workstations, has a collegiate feel*

Keeping up to date

In part, this schooling is valuable in that it keeps the troops technically proficient. For instance, according to Paul J. Cosgrave, a principal at the firm, Andersen wants 90% of its consulting staff schooled in client/server concepts within two years, up from the 10% who have these skills today.

However, Andersen's schooling also seeks a subtler, perhaps even more important, goal: imbuing its consultants with a common way of approaching and solving problems.

"In the '60s, the driving idea was to have a 'core competence,' which back then [meant] technical, functional and industry skills," said Alan C. Nowakowski, director of Andersen's Technical Core Education. Nowakowski works at "school central" for Andersen — that is, its Professional Education Division, located here.

Teamwork skills

Nowakowski said Andersen's service lines have broadened, and each practice has a set of core skills. "But we also need common skills to enable teamwork," he said.

Both Andersen and its competitors have begun to emphasize the building of dynamic relationships between different kinds of consulting. In Andersen's case, this involves strategic services, systems integration, systems management and change management.

Teamwork is also a required course, in the view of Andersen officials, because of the company's unofficial motto of being able, on short notice, to assemble a task force of its best and

Continued on page 98

Clambering on the consulting services bandwagon

Unisys seeks users to fit client/server strategy

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. joined the crowded strategic systems consulting market last month, launching a service that seeks to match a customer's business agenda with Unisys Architecture, the firm's client/server-based enterprise computing strategy announced last October.

Analysts and Unisys users, however, greeted the consulting announcement coolly. A number of each said Unisys has neither the expertise to provide strategic consulting nor the financial resources to buy the expensive personnel such services demand.

"This kind of work is incredibly expensive. It's labor-intensive and people-intensive," said Robert Kidd, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. Kidd noted that Unisys, along with IBM and other hardware vendors, is clearly aware that future growth will belong to software and services, as margins on hardware sales continue to tumble. "But I'm convinced [Unisys] does not have the skill set [to catapult into that arena] now," Kidd said.

Many Unisys users, albeit quick to lavish praise on Unisys' hardware and software development platforms, seemed to agree.

"Nobody will hire them — they'd be nuts if they did," said one user at last month's joint Cube and Use, Inc. conference in Denver.

But others disagreed. Dean Sutton, president of Softchec, Inc. in Kirkland, Wash., and a member of the board of Unisys user group Cube, argued that in its chosen core industries — financial services, communications, airlines and government — Unisys does in fact have the requisite talents.

"I'd hope Unisys is in the market to sell software solutions and make hardware secondary," added Herman Schuler, director of systems development at Group W, a Westinghouse Broadcasting Co. firm based in Milford, Conn. Although Schuler said his shop had no call for consulting services of this kind, he speculated that the low end of the market might.

"I'd prefer if [Unisys would] take its marketing staff and focus on the small shops, because that's where the growth is," he

Continued on page 100

Fixed-price approach distinguishes Wang

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. recently threw its hat into the already crowded ring of work-flow re-engineering and systems integration consultants.

Christening its brand of office re-engineering Business Process Management (BPM), Wang said the offering will differ from traditional Big Six consulting services in its modular, fixed-price approach to client needs.

"We will go in with a very specialized, vs. a generic, approach," said William T. Wilde, vice president of the Professional Services Group.

This means BPM will focus on specified target areas within a user company and offer up-front evaluation and determination services at a predetermined price.

According to Wilde, the services will focus on improving customer productivity, quality and services and will be committed to the open systems concept by drawing on both Wang and non-Wang solutions.

BPM's process approaches work-flow evaluation in a three-pronged manner: through an analysis of the work-flow process, by measuring the productivity and output of each task and by offering a quantitative profile of the targeted department as a whole.

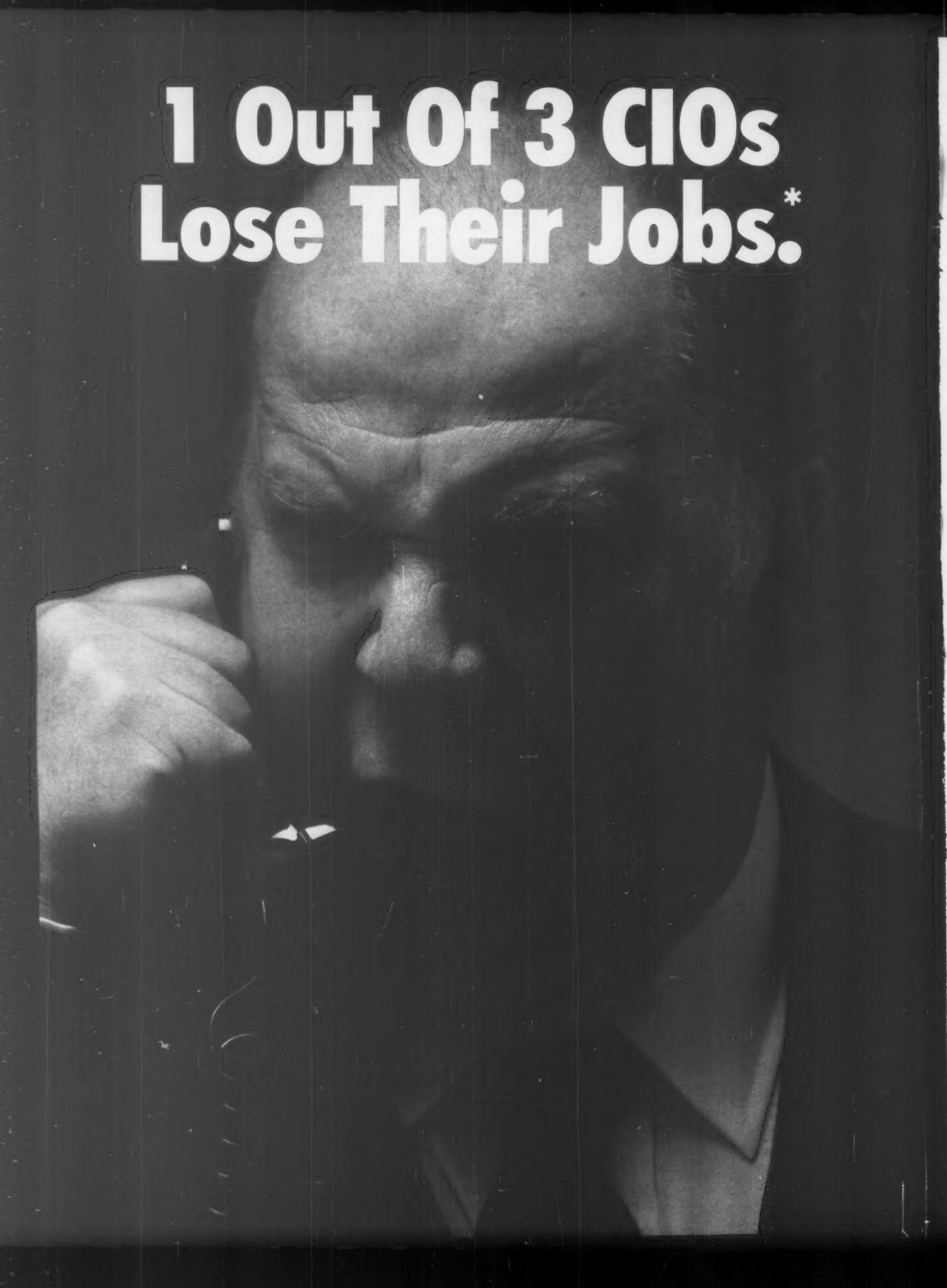
The process will also take into consideration the human dynamics of an organization and the potential resistance to change, Wilde said.

Changing stance

One BPM customer, Robert R. Lukas, assistant vice president of information management systems at ITT Hartford Insurance Group, said he was initially skeptical of Wang's BPM strategy but has since reversed his position.

The Hartford has been piloting a Wang image-processing system in its Pittsburgh claims office, and according to Lucas, BPM helped the company develop a proper design for the department.

"Today in Pittsburgh, the employees themselves are helping to decide the work-flow process; it is a productive, proactive approach," Lukas said, adding that after each task is quantified, there is now "so much new data available that we have to look for a discipline to help us take advantage of this."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Andersen recruits to a class act

CONTINUED FROM PAGE 95

brightest employees from anywhere in the world. "We believe that a client ought to have access to the best talent we have available, and that access ought to ignore national boundaries," said A. George (Skip) Battle, managing partner at the Market Development Group. Andersen's clients, meanwhile, have broadened their horizons and "increasingly want to make sure the solutions they contemplate will work globally," Battle added. Most of Andersen's consultants, in fact, are employed outside the U.S.

School days

After being hired by Andersen Consulting, fresh, young consultants — Andersen's consultants are a young lot, with an average age of 25 — spend three weeks training in their local office, including self-study on a workstation.

Following this, they journey to one of Andersen's four training locations. In addition to the original St. Charles site, there are now centers in Manila, Singapore and Veldhoven, The Netherlands.

During the 8 a.m. to 10 p.m. class day, students learn Andersen's methodology, as well as how to interact with clients and other Andersen workers. Indeed, embedding Andersen's philosophy of the "work group" is key during this period and even includes "activity games" that have recently become fashionable in corporate America, such as climbing rope ladders in the woods.

Yet, is the total impact of Andersen's training somewhat Orwellian — a kind of consultant cloning that makes "Andersen-speak" the only language?

Not at all, Nowakowski said.

"The stereotype of an Andersen consultant as a tech-head is wrong," he said. "We've always had broad requirements and have always wanted personable people." Besides, he added, it would be naive to think regional and national differences go away under Andersen's training regime, or even that such a result would be desirable.

Cozy and collegiate in feel

Andersen officials likewise frown when their U.S. center is referred to as a "boot camp." Indeed, there is nothing military-looking about the center, a former women's college that Andersen bought 21 years ago. Apart from the fact that these "students" attend classes dressed in business suits, the feel of the place — from its excellent cafeteria to an abundance of small, cozy lounges — is distinctly collegiate.

The St. Charles center can house more than 1,700 workers, contains more than 1,000 computer workstations and has 135 classrooms as well as two amphitheaters, five conference centers and a six-bay auditorium.

What it does not have are graduates: Education is ongoing throughout one's career at Andersen. The annual training requirements for each systems integration consultant are as follows: staff/senior (770 hours), manager (320 hours), partner (48 hours). Employees who can look forward to continual improvement are also loyal workers, it turns out.

Andersen employees are a plus for the clients they serve, said an IS director at a major industrial firm who asked to remain anonymous.

"Andersen's training shows," he said.

I, likewise, speak English

Since 1987, English has been the official language at Andersen Consulting, although the company had stressed the English language for a good decade before that.

Basic competence in English, however, does not automatically mean communication or comprehension. Therefore, Andersen's English workshops include instruction on pragmatic language skills such as how to negotiate, how to apologize and how to persuade at a business lunch.

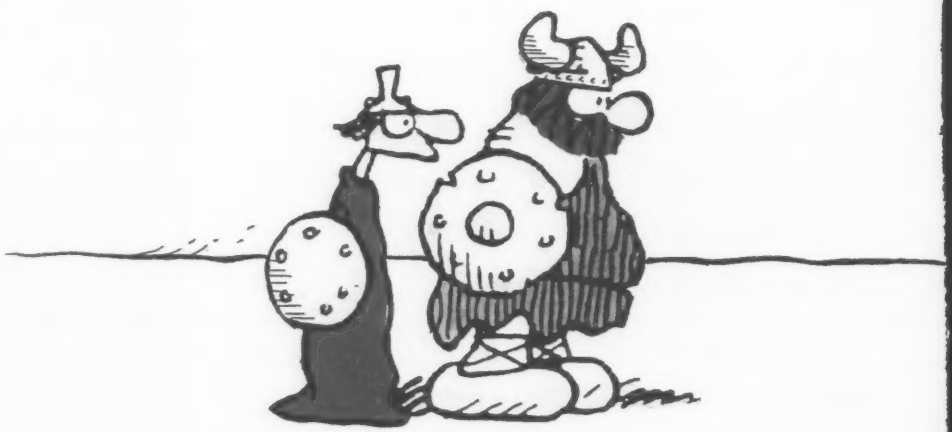
Meanwhile, all the consultancy recruits, including native English speakers, learn to appreciate cultural peculiarities — without which facility one can unwittingly offend or miscommunicate and wreck a business relationship.

"We teach things like not showing the heel of your shoe to a Hindu client," one instructor said.

Andersen is also investigating novel, multimedia platforms for teaching its recruits. Last year, for example, it launched The Institute for the Learning Sciences at Northwestern University. The Evanston, Ill.-based institute, run by former Yale University artificial intelligence guru Roger C. Shank, is looking at a host of technologies that could increase the amount of computer-based training used by Andersen to 10% to 20%, up from 1% today.

ELLIS BOOKER

Don't settle for graphics



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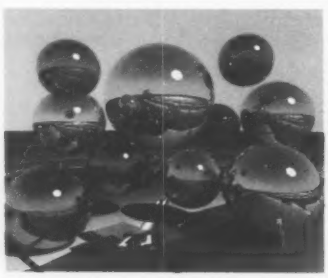

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Entrepreneur powers way in client/server market

BY SALLY CUSACK
CW STAFF

BURLINGTON, Mass. — Mitchell E. Kertzman is enjoying the good life. His company did $17.5 million worth of sales in 1990. But it was not too long ago that the founder and president of Powersoft Corp. wondered where his next revenue stream was going to come from.

It looks like he found it.

According to Stuart Woodring, a senior analyst at Forrester Research, Inc., a consulting firm in Cambridge, Mass., the company's recently announced client/server database development tool is taking the market by storm.

Dubbed Powerbuilder, the software product is generating substantial user interest, Woodring said.

One early user, Eric Reed, manager of tools and architectures at BSG in Houston, said the product offers the ability to manage multideveloper, large-scale projects in the client/server area. He is also pleased with Powerbuilder's ability to manage back-end databases.

BSG is a large-scale systems integrator with approximately 50 active accounts.

Kertzman: *'It was time to re-architect'*

Pointing out that the client/server market is fairly new and subsequently not very big, Woodring acknowledged that Powersoft is "certainly a leader in mindshare" at this stage of the game.

But Kertzman, a self-described college dropout, clearly remembers the not-so-good old days.

Back in 1974, at the helm of the firm he founded as Computer Solutions, Kertzman was literally a one-man software consulting corporation. For the first five years, he offered a combination of services, from customized software development to time-sharing on computers. His first breakthrough came with the development of manufacturing resource planning (MRP) II-type software systems, a version of which Powersoft still sells.

In the early 1980s, the manufacturing software business turned a profit and has remained profitable since 1986.

In the late part of the decade, however, when many high-technology companies were holding fire sales or contemplating bankruptcy, Kertzman and his team, now numbering over 100, accidently stumbled into the world of client/server computing.

"We were doing well," Kertzman said, "but only in North America and only on the HP 3000 platform. Our software was difficult to internationalize, and it was clearly not portable. I took a look at where the industry was going and where we were: It was time to re-architect our software."

> "POWERBUILDER IS getting more attention than anyone else's database development tool for the client/server environment. It has a very, very high profile."
>
> STUART WOODRING
> FORRESTER RESEARCH

In the process of reworking the complex MRP II program, Powersoft developers were searching for sophisticated, personal computer-based development tools. While there were some on the market that painted a clear graphical user interface and some offered by database and fourth-generation language vendors, there was nothing that incorporated networked interfaces and PCs, Kertzman said. Enter David Litwack, formerly executive vice president of product development at Cullinet Software, Inc.

"David had a business plan to build what turned out to be our next generation of software," Kertzman said.

Litwack joined Powersoft in 1988 as head of research and development and started building the company's future products — namely Powerbuilder.

The software was introduced in March 1991 and has been shipping since June. Kertzman characterized the product line as a "rocket to the moon."

"Powerbuilder is getting more attention than anyone else's database development tool for the client/server environment," Woodring said. "It has a very, very high profile."

One reason for this attention is timing, he said; another, however, lies in the product's features. When Powerbuilder first hit the market, Woodring said, there was not much else available in the way of easy-to-use client/server development tools.

So far, Powerbuilder has ushered its vendor into a cooperative marketing agreement with industry giant Microsoft Corp. and a strategic partnership with Dun & Bradstreet Software.

Banking on Powerbuilder's future success, Powersoft has also recently signed six strategic partners in Europe, Hong Kong and Australia.

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subsystem which produces almost a million 3D vectors and 120,000 Gouraud-shaded triangles per second, for fast, realistic shading effects.

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Unisys seeks client/server users

CONTINUED FROM PAGE 95

said. Indeed, the pricing details of Unisys' Enterprise Information Technology Planning service would suggest it is targeted at smaller IS departments.

For a flat fee of $40,000 for small to midsize customers, the Enterprise Information Technology service provides the following based on workshops with key management personnel:

- A determination of business objectives.
- A functional overview of a standards-based architecture to reach these goals.
- An overview of current IS technology and investments.
- A transition strategy and plan.
- An analysis of the organizational, cost and training implications of an open systems transition.

Unisys also said that to complement this planning service, it would launch an Application Solutions Planning service in the first quarter of 1992.

According to Unisys executives, the new consulting services will not interfere with the company's strategic relationship with KPMG Peat Marwick. Earlier this year, KPMG Peat Marwick said it would develop line-of-business solutions under Unisys' applications development software platforms.

Sun unloads visualization end

MOUNTAIN VIEW, Calif. — Opting to concentrate on high-volume, low-end Unix systems, Sun Microsystems, Inc. recently sold its high-performance visualization accelerator business to Vicom Systems, Inc., a scientific and medical imaging systems company based in Fremont, Calif.

The move lets Vicom get a foot in the open systems door. The firm will take over the manufacture, sales and support of Sun's VX and MVX visualization accelerators. Vicom also sells proprietary systems that it obtained from Pixar Co. and Gould, Inc.

Vicom's systems will run Sun's operating system and Sunvision visualization software.

"Any applications written on Sunvision will be able to run on our platform [in accelerated mode] or on a Sun platform in nonaccelerated form," said Arun Taneja, vice president of marketing at Vicom.

Sun will continue to sell lower end graphics accelerators: the GX, GXplus, GS and GT.

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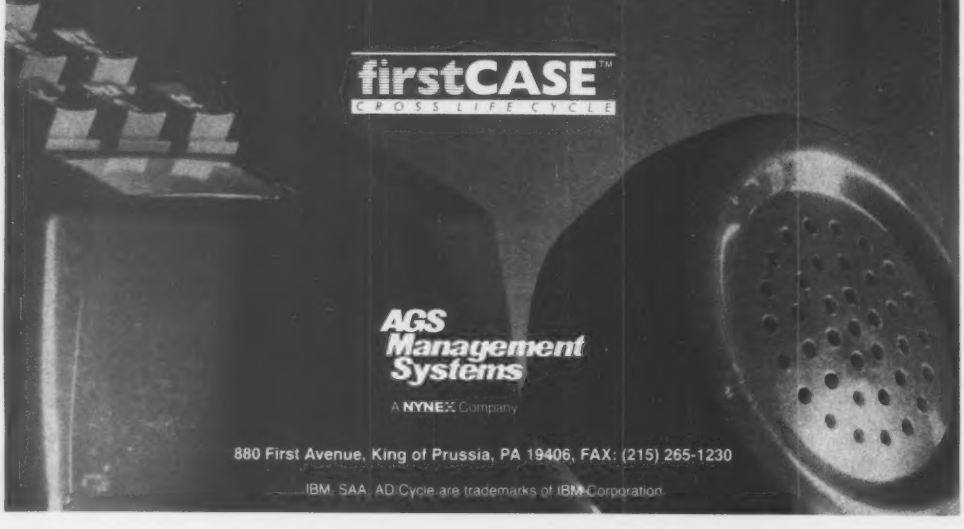

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▶ **Toshiba Corp.** denied a report in the Japanese daily press late last month that it would soon be signing on as an OEM of microprocessors manufactured by Germany's **Siemens AG** and Santa Clara, Calif.-based **Integrated Device Technology, Inc.** According to Toshiba, the three firms have merely been exchanging information; no agreement has been reached.

Don't fence me in

▶ **Compuprint Bull**, a unit of France's **Groupe Bull**, is launching four page printers — two of them manufactured completely in-house — into a market currently dominated by Japanese printer companies. "It's an ambitious bet," said Compuprint General Director **Renato Pucci**, "but we're talking about an irreversible strategic choice. We want to control the production of our products so as not to become box sellers."

Let the open systems games begin

▶ **IBM Canada Ltd.** is Canada's largest computer firm. Under the aegis of new Chief Executive Officer **John Oltmar**, Toronto-based systems integration firm **SHL Systemhouse, Inc.** has been expanding its executive suite and its corporate mandate on a virtually weekly basis of late. Now the $4.6 billion IBM subsidiary and the $700 million systems integrator are teaming up to advance the IBM RISC System/6000 workstation as the vehicle to usher users into the Canadian open systems arena. Their technical and marketing support pact, announced late last month, is valued at an estimated $100 million during the next several years.

Phone firms hang up Australian bid

▶ Telecommunications players **Ameritech** and **Bell Atlantic** are withdrawing from the race to become **Australia**'s second telecom provider, according to a report last week in the local business press. The two, along with French national carrier **France Telecom** and Hong Kong-based **Hutchinson Telecommunications**, had formed a consortium under the name **Kalori** to bid for the license. Hutchinson reportedly wants to continue with the bid; its consortium mates, however, plan to tell the Australian government they no longer want a piece of the action.

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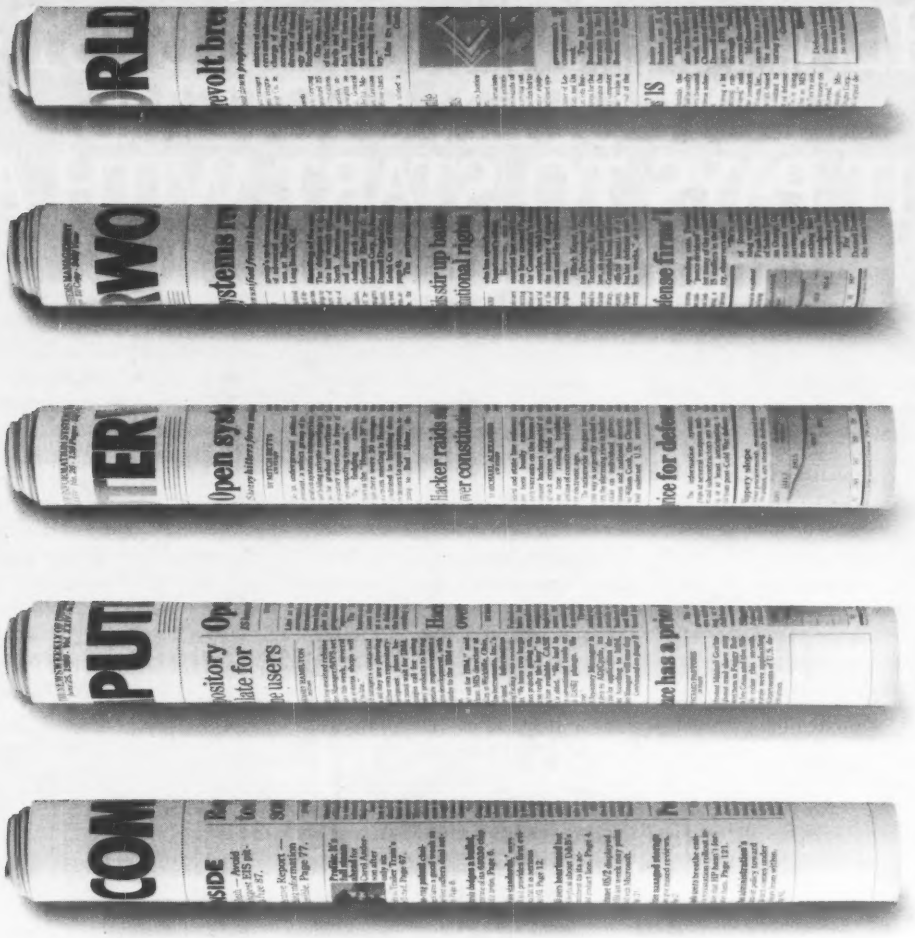

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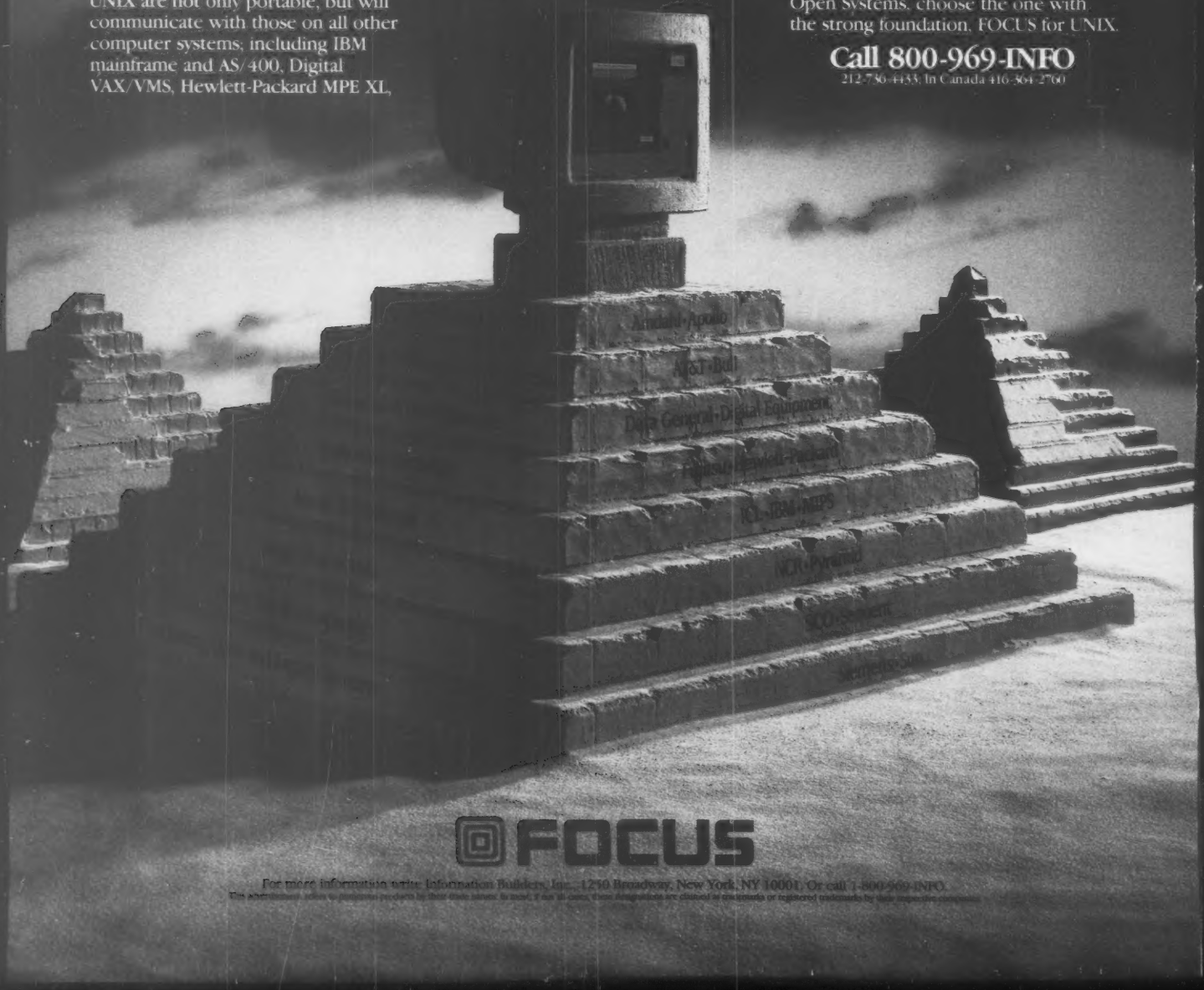

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COMPUTER CAREERS

Take chances and diversify on your journey to upper ranks

BY KATIE CRANE
SPECIAL TO CW

Would you like to head up the information systems function at a top U.S. corporation? If so, then chances are you'll have to make a few detours on the way.

An informal survey of top IS executives indicates that a significant number actually started their careers in other departments, and most have a broad base of experience in other areas of the business.

Sid Diamond, vice president of worldwide information services at The Black & Decker Corp. in Towson, Md., moved to IS from marketing planning and says, "it was just a stroke of luck that I was a good fit." Al Hyland, director of worldwide systems at Polaroid Corp. in Waltham, Mass., started in research. S. I. Gilman, executive director of IS at Ford Motor Co. in Dearborn, Mich., describes himself as a "finance guy" who was in the right place at the right time. William F. Osl, vice president of information management services at AT&T in Warren, N.J., moved from finance to manufacturing to purchasing to marketing.

Polaroid's Hyland *encourages execs to take on the challenge of difficult assignments*

There are insider success stories, of course. Linda George, director of corporate IS at Gencorp, Inc. in Akron, Ohio, began with a technical background; she studied to be a math teacher and became a programmer.

Business travel

Perhaps because of their own backgrounds, most of these top executives feel that IS professionals should work in at least two or three different areas of a company. Diamond says that it is ideal when a systems person can take a tour of duty into business operations to see how the technology is applied. "The top IS job is like a 'three-legged stool,' " he explains. The job requires an unusual blend of technical and business knowledge along with leadership skills and personal chemistry.

You can develop business acumen and management skills without leaving IS. It's harder, but it can be done.

One way of doing that, Gilman says, is to seek out jobs such as applications development, where you are close to the nuts and bolts of the business. You learn from peers on the business side, he explains, by going to them and asking: What's important to you?

AT&T's Osl *recommends that aspiring IS professionals learn business lingo*

Going back to school for an MBA can also augment on-the-job training and experience, according to George. "The CIO is a member of the management team who happens to specialize in IS," she says. George says she feels her MBA is enhancing her performance of that role.

However you acquire it, if you aspire to lead the IS function, you'll have to learn business lingo. Osl works with business unit presidents who are managing Fortune 50-size companies. "I need to think and talk in their language in order to be able to translate the technical message into business terms they'll understand," he says.

Hyland challenges would-be IS executives to take on difficult assignments. Yes, they are more risky, he says, and some things will go wrong. But "you have to risk occasional failure in exchange for the experience and sense of confidence you will gain from the assignments that go well," he says.

Think gray

It is also a good idea to practice saying "maybe" and searching for the shades of gray in situations.

"If you have been trained as a programmer, there is always a correct answer; it's either this or that," says Daniel Cavanagh, senior vice president of IS at Metropolitan Life Insurance Co. in New York. But one thing that you learn rapidly when you move into management is that there isn't always a right answer.

Gencorp's George *says whatever you do, remain flexible and don't specialize*

Whatever you do on your way to executive status, those who are there say, "Don't specialize." George says flexibility has been the key to her success. She's moved frequently and, as a result, says she was never "cemented" into one technology or one way of doing things. In her words, she has "latched onto and sponsored" new concepts, such as end-user computing 10 years ago and business process re-engineering today, which have given her a platform to demonstrate her abilities.

Crane is a free-lance writer based in Norwich, Vt.

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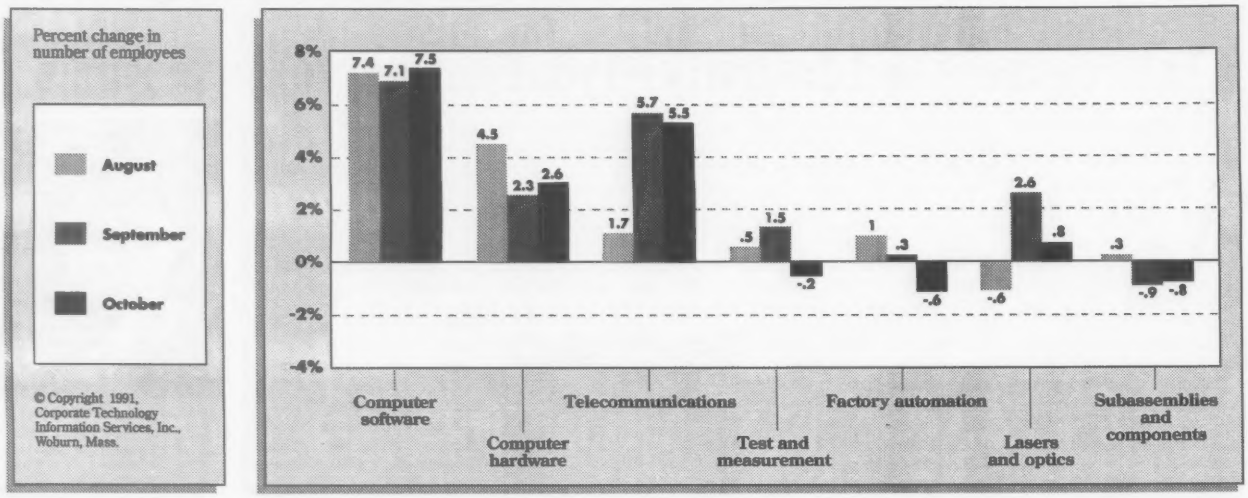

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INDUSTRY CURRENTS

Banking: A few glimmers amid the gloom

BY JULIA KING
SPECIAL TO CW

These days, the chances are that if a bank isn't downsizing or outsourcing, it is merging or undergoing a reorganization. Given those realities, it is hardly a surprise that employment prospects in this field are generally poor and that there's a surplus of bank-trained information systems personnel at almost every level.

Despite all the chilling headlines, however, there are some positive glimmers in the employment picture.

Not only are outsourcing companies often agreeing to pick up most or all IS employees from the organizations contracting for their services, but in some cases, they are acquiring so much business that they are recruiting additional help.

For example, Pittsburgh-based Mellon Bank Corp., which furnishes IS services to 700 other banks, is actively recruiting both entry-level and experienced applications and systems programmers as well as systems integration experts, says David Moore, senior vice president of information processing.

Right now, the ones who are suffering the most from outsourcing are the senior executives, who are often not included in the hiring deals that providers commonly strike with their new clients.

"The basic premise when you put two organizations together is that the management structure is redundant," says John Gigerich, Continental Bank Corp.'s current chief information officer.

This month, Gigerich will be out of a job when his bank's outsourcing contract with IBM is finalized. With outsourcing, he says, "there's no need to have a CIO like me."

Better times ahead

But even for displaced CIOs, some industry observers believe, some better times may be coming.

"Technology has become critical to financial institutions, and its rise in prominence has been phenomenal," notes Tom Campbell, a managing partner at Heidrick & Struggles, Inc., a Chicago-based executive search firm. To this end, he says, it is not unheard of for CIOs to be promoted to executive posts in other banking departments, which are increasingly relying on information technology systems to develop new products and services.

While not immediately apparent, mergers and acquisitions can also work to the advantage of IS professionals in banking, recruiters say.

"Right now may be an uncertain time in banking, but all of that will change in about 18 months as banks need people to manage IS at the mega-institutions created from the merger-mania," says Jay Gaines, president of Jay Gaines & Co., a New York-based executive search firm.

"The bigger the merger, the more diversified the newly consolidated organization will be, so it will be needing IS professionals across all departments," agrees J. W. Pieper, senior vice president at First City Bancorp-Texas in San Antonio.

This trend has already been borne out at Bank of New York, which last year merged with Irving Trust Co. "Information systems plays an even more important role with mergers and acquisitions," notes Tony Garofalo, senior vice president of data processing at the consolidated firm. At Bank of New York, for instance, there were no IS staff reductions as a result of the merger, he says.

Future opportunities

Two mergers currently in the making — between Chemical Banking Corp. and Manufacturers' Hanover Corp. and between Bankamerica Corp. and Security Pacific Corp. — will create "tremendous opportunities" for IS professionals, according to Gaines, who says these opportunities will begin to present themselves "once the mergers are fully executed and management assesses where additions need to be made."

In the meantime, IS professionals interested in the banking industry would be well-advised to acquire or polish those skills likely to be in highest demand at newly consolidated organizations. Topping this list is a solid grounding in diversified banking products, including mortgage loans and stock transfer services.

"The trend in the banking industry is to integrate information systems more deeply into the business units they support, rather than retain large, centralized IS staffs," Moore notes. "This means that they need to look at themselves not as IS professionals, but as bankers."

Recognizing the need for this kind of industry and product knowledge among IS workers, the American Bankers Association, based in Washington, D.C., offers a two-week course through its Business of Banking School. The course can be taken in-house at sponsoring banks or through the association, which presents the course once a year, according to Pieper, who also chairs the association's automation and operations committee.

On the technical side, managers say, individuals with sharp networking and systems integration skills will be in the greatest demand at combined financial institutions. This is because mergers necessarily involve the melding of two or more organizations' networks, systems and software, which are often incompatible.

Applications and systems programmers, particularly those experienced with IBM's CICS, the Unix operating system and Cobol programming language also will continue to be needed, managers say.

Other options

For those IS professionals unwilling or unable to wait for the anticipated growth in banking opportunities, jobs are available in other fields, recruiters say. For instance, skills and knowledge acquired in the banking industry are highly transferrable to health care and insurance companies and Wall Street firms.

Consulting is another prime area of opportunity, according to John Queenan, senior vice president at Lee Hecht Harrison, Inc., an outplacement and career consulting company based in New York.

Many IS workers displaced by the banking industry are top-notch systems professionals with years of experiences, he says, adding that once the dust settles throughout the industry, banks will be increasingly calling on these people to help consolidate their new IS operations.

King is a free-lance technology writer based in Ridley Park, Pa.

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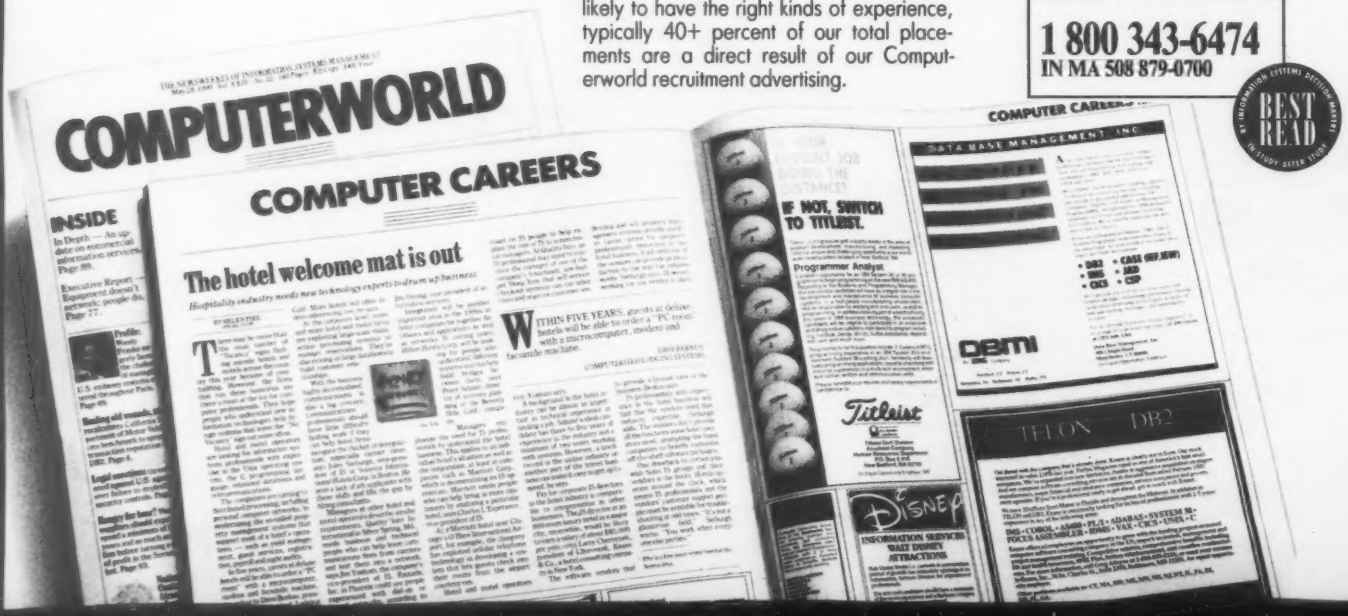

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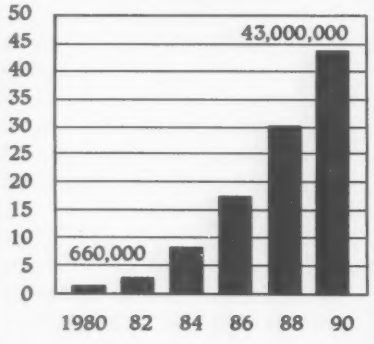

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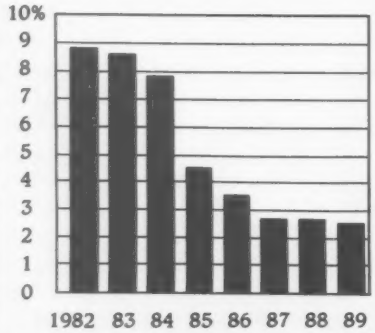

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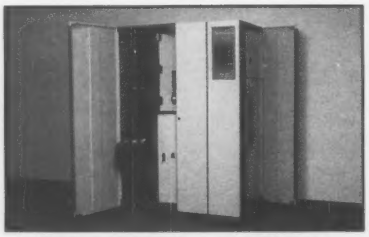

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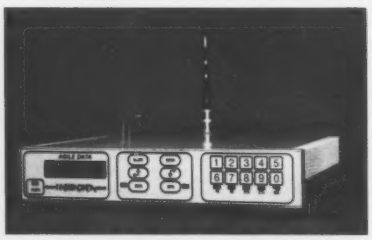

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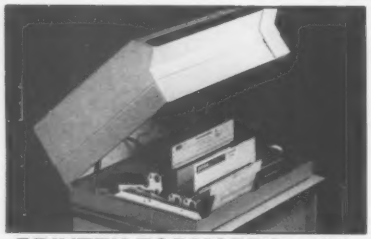

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Playing it smart with LAN power protection

BY ALAN RADDING
SPECIAL TO CW

As local-area networks become home to increasing amounts of critical data, protecting that data from power glitches and outages is becoming a serious issue for many companies.

This fact has not escaped the attention of vendors of uninterruptible power supplies (UPS). Many are offering the extra protection of intelligent units — ones that will shut down and reboot systems automatically in the event of a power failure — specifically aimed at the LAN market.

There are six major providers of intelligent UPS systems for LAN server use: American Power Conversion Corp., Elgar Corp., Tripp Lite/Unison, Exide Electronics Corp., Emerson Computer Corp. and Best Power Technology, Inc. But it is a growing market, and more players are likely to appear.

Pricing for intelligent UPSs for LANs start at $500 and run up to $2,000, depending on the power requirements. By comparison, nonintelligent UPSs for personal computer-based servers start at about $250.

The major cost of the UPS is determined by the load it must carry, as measured in kVA or watts, and the runtime, typically measured in minutes for a LAN.

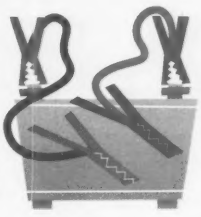
Unattended operation and other intelligent features reduce the required runtime, but they add a few hundred dollars to the cost. For example, a Smart-UPS 400 from American Power lists at $499. A unit with the same load and runtime but without intelligence lists for $249.

Small price to pay

Charter Federal Savings Bank in Bristol, Va., which spent approximately $1,600 for its 1.2 kVA intelligent UPS, says the investment was worth it. "That's not much money to protect a $60,000 investment in the network and server," says Patrick Garrett, systems engineer at the bank.

According to information systems professionals who've used them, intelligent UPSs offer two key benefits: They reduce the need for a system administrator to always be on site, and they allow the organization to purchase less battery capacity.

For example, in the past, system managers opted for 45 to 60 minutes of backup power to allow ample time for someone to get to the server during a power outage. Intelligent UPS systems, however, communicate directly with the network operating system, which performs unattended shutdown. Because there is no need to wait for an attendant to arrive, the actual shutdown only requires 10 to 15 minutes of backup power, significantly reducing the amount of costly battery capacity required. And if power comes back before the server shuts down, the UPS signals that all is fine, and normal operations can be resumed.



When purchasing an intelligent UPS for a LAN, system managers should pay attention to the following factors:

• How the unit makes the communication connection to the server.
There is no standard communications interface. Some UPSs connect through a mouse port; others use a serial port.

Bob Ferioli, a PC programmer/analyst at Volvo Cars of North America in Rockleigh, N.J., chose a small American Power UPS because it came with a cable that connected through the mouse port to its IBM Personal System/2 server running Novell, Inc. Netware 286. All Ferioli had to do was define the time parameters in Netware — five minutes in Volvo's case.

However, Charter Federal failed to check how the UPS communicated with the server and was consequently unable to initiate unattended shutdown, Garrett says. The communication from the UPS to the Intel Corp. 80386-based server goes through a serial port, which Garrett's server lacks.

• Compatibility with the network operating system.
If the network operating system can't take advantage of the intelligence of the UPS, the investment will be a waste of money.

For example, the Banyan Systems, Inc. Vines server software at Stanley Fastening Systems, Inc. in East Greenwich, R.I., does not allow the LAN manager to set the time before automatic shutdown begins. Instead, it waits one minute for power to be restored before beginning the automatic shutdown procedure. Bill Bunch, PC coordinator and network administrator at the company, recalls watching his server shut down during a brief outage while the UPS hummed along for almost an hour putting out power for naught.

• Ability to bring the server back up, unattended, when power is restored.
"We use a [Netware Loadable Module] from American Power with Powerchute software, and it brings up our Systempro automatically," says Andy Hofer, manager/microcomputer support at Time Warner, Inc. in New York. The software, $99, is easy and quick to install, he adds. Programming the unattended operation is simply a matter of telling the network operating system when to start shutdown.

Some products, such as American Power's Powerchute Plus, Elgar's Lansafe Plus, and Best Power's Check UPS, offer automatic reboot.

• Miscellaneous features.
Many intelligent UPSs also provide information about power conditions: the state of the batteries, the current load and power quality. The systems monitor and log power conditions and critical events, allowing managers to more easily diagnose problems. Other features include remote dial-in access to the UPS, self-testing and graphical displays.

Radding is a free-lance writer based in Newton, Mass.

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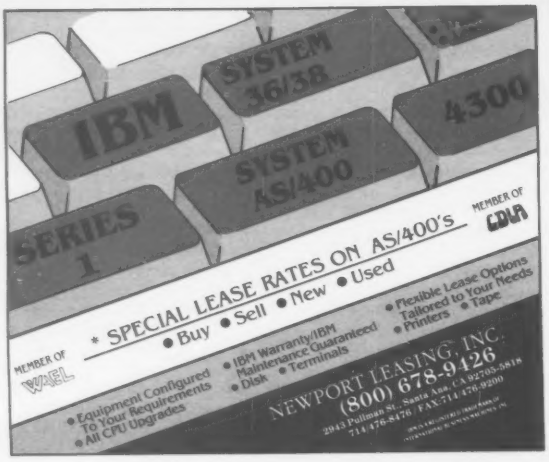
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INDUSTRY ALMANAC

ANALYSIS IN BRIEF

Computer Services/Software: Secular Trends, Mabon Securities Corp., New York, October 1991. Outsourcing is the single biggest revenue opportunity in technology. Contracts are often huge and long-term, and penetration rates among customers are minimal. Customers actually receive book-value payment for their equipment and no longer have to worry about spiraling data processing budgets because the operating prices are guaranteed. Primary beneficiaries are **Electronic Data Systems Corp., Computer Sciences Corp.** and, to a lesser extent, **Automatic Data Processing, Inc.** Several smaller vertical market players also exist, including **Policy Management Systems Corp.** and **Fiserv, Inc.**

RECOMMENDATION CHANGES

UPGRADED FROM SELL TO BUY: **Compaq Computer Corp.** (Prudential Securities, Inc.). Third-quarter loss supports the theory that Compaq was suffering primarily from an inventory glut, not from an irreversible secular decline in market position. Recent data on U.S. orders shows a recovery from the summer slump. Recent management shake-up will be good for the firm because the new top dog is more committed to a market share strategy. Reorganization into a core personal computer unit and a high-end group makes sense. Expect a target stock price in the mid-40s.

UPGRADED FROM SELL TO BUY: **Amdahl Corp.** (Prudential). The firm appears to be in the final phase of debugging new 5995-M Series mainframes, and the risk of a major slippage is small. Amdahl will likely ship a handful of the new machines in late December, with volume production scheduled for April 1992. Revenue should climb. Shares should reach the low 30s within a year.

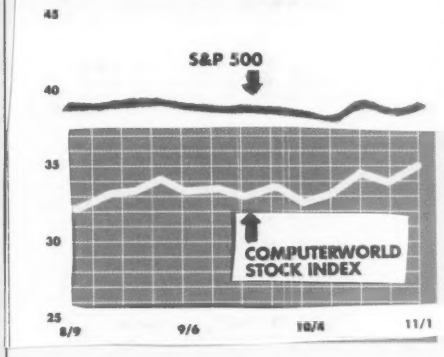
UPGRADED FROM HOLD TO BUY: **Silicon Graphics, Inc.** (Bear, Stearns & Co.). First-quarter profits for fiscal year 1992 were at the high end of expectations. Products seem to be on schedule, including the new Indigo workstation and a more advanced system based on the R4000 processor. When volumes of that chip hit the market during the first few months of next year, Silicon Graphics will be one of the first vendors to ship products based on it. By the second quarter, all major applications that currently run on the company's other platforms will be ported to Indigo.

UPGRADED FROM AVOID TO HOLD: **Maxtor, Inc.** (Bear, Stearns). Although the company is still not out of the woods profitwise, it appears that the firm's new management team is acting quickly to get Maxtor back on track. The key will be new products that are due out during the next few months.

DOWNGRADED FROM BUY TO HOLD: **Equifax, Inc.** (Bear, Stearns). As one of the leading providers of credit reporting, insurance and check guaranteeing services, Equifax continues to be hit hard by the recession. A company restructuring has not helped margins yet, leaving 1992 results uncertain. TRW, Inc., the other major player in the credit reporting business, has announced its intention to offer free reports to consumers once per year. Equifax has not yet answered that move but indicated it might lower the price of reports sold to consumers. A flood of requests for reports could have a negative impact on the company for one or two quarters.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Investors catapulted Borland International, Inc. 18⅜ points higher last week to close Thursday at 67⅜. Analysts, fired up after a financial conference with the company, praised Borland over Lotus Development Corp. Lotus, meanwhile, lost 2 points, falling to 24¾.
- Compaq Computer Corp. continued to slide last week, falling 4⅝ points to 28⅜. Compaq recently reported a surprising quarterly loss and replaced its president.
- Network vendors Novell, Inc. and Cabletron Systems, Inc. climbed upward again last week. Novell jumped 7½ points to 51¾. Cabletron advanced ⅜ of a point to 46⅜. AT&T added 1⅛ to hit 38⅞ after saying it will revamp its communications units.
- Data General Corp., which closed out its first profitable year since 1985, lost 4 points last week to 17⅝. Amdahl Corp. was active at the end of the week; it gained 1¼ points to 15½. Wang Laboratories, Inc. lost ⅛ of a point to close at 2½, near its 52-week low.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, NOVEMBER 1, 1991

TOP PERCENT GAINERS

Borland Int'l	45.31
System Software Assoc.	35.44
Phoenix Technologies	27.78
3 COM Corp.	23.36
Novell Inc.	18.24

TOP PERCENT LOSERS

Intellicorp Inc.	-28.52
Dell Computer Corp.	-16.97
Data General Corp.	-16.25
Ultimate Corp.	-13.04
Weitek	-12.96

TOP DOLLAR GAINERS

Borland Int'l	21.75
Novell Inc.	7.75
BMC Software Inc.	7.38
System Software Assoc.	7.00
Policy Management Sys.	4.13

TOP DOLLAR LOSERS

Dell Computer Corp.	-4.63
Data General Corp.	-3.25
Lotus Development	-2.50
AST Research Inc.	-2.50
Compaq Computer Corp.	-2.38

Exch	52-Week		Range	Nov. 1 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 5.49%**
OTC	11.88	5.50	3 COM Corp.	11.88	2.25	23.38
NYS	69.75	55.75	American Info Techs Corp.	61.75	0.38	0.61
NYS	40.38	29.00	AT&T	38.63	0.63	1.64
OTC	4.13	0.88	Artel Communication Corp.	2.13	0.31	17.21
NYS	56.25	43.00	Bell Atlantic Corp.	46.38	1.75	3.92
NYS	56.25	46.13	Bellsouth Corp.	49.00	1.50	3.16
NYS	52.88	22.38	Cabletron Systems	45.63	2.25	5.19
OTC	29.25	8.25	Compression Labs Inc.	24.00	-0.25	-1.03
OTC	5.13	2.00	Data Switch Corp.	2.50	0.00	0.00
NYS	21.50	9.75	Digital Comm. Assoc.	16.75	1.38	8.94
OTC	25.25	14.00	Dynatech Corp.	16.75	-0.25	-1.47
OTC	12.38	5.00	Fibronix Int'l Inc.	6.38	0.38	6.25
OTC	22.00	6.50	FileNet Corp.	22.00	2.63	13.55
OTC	3.75	1.75	Gandalf Technologies Inc.	2.00	-0.06	-3.05
NYS	3.75	1.63	General Datacomm Inds.	3.75	0.25	7.14
NYS	33.50	27.50	GTE Corp.	32.75	1.25	3.97
NYS	63.00	44.50	ITT Corp.	56.38	0.88	1.58
OTC	32.50	17.88	MCI Commmunications Corp.	25.75	-0.63	-2.37
OTC	12.00	3.25	Microcom Inc.	12.00	1.00	9.09
NYS	14.63	4.00	Network Equipment Tech.	14.63	0.75	5.41
OTC	15.38	5.25	Network General	14.13	1.63	13.00
OTC	18.88	8.50	Network Systems Corp.	16.75	0.00	0.00
NYS	41.38	24.00	Northern Telecom Ltd.	41.38	0.75	1.85
NYS	50.25	12.75	Novell Inc.	50.25	7.75	18.24
NYS	77.88	67.00	Nynex Corp.	77.88	2.00	2.64
NYS	47.00	38.50	Pacific Telesis Group	43.13	3.25	8.15
OTC	11.63	4.50	Panril Data Comm. Ntwks.	8.00	0.00	0.00
OTC	43.50	8.50	Picturetel Corp.	40.75	2.50	6.54
NYS	17.88	9.25	Scientific Atlanta Inc.	14.38	0.75	5.50
NYS	60.38	49.00	Southwestern Bell Corp.	52.38	4.00	7.10
NYS	21.50	20.63	United Telecom	23.38	0.38	1.63
NYS	40.75	34.00	US West Inc.	35.88	0.88	2.50
Computer Systems						**Off 0.50%**
OTC	20.75	6.50	Advanced Logic Research	12.75	0.75	6.25
ASE	17.88	11.50	Amdahl Corp.	15.63	1.75	12.81
OTC	73.25	32.00	Apple Computer Inc.	51.00	-0.25	-0.49
OTC	9.13	2.75	Archive Corp.	3.88	0.13	3.33
OTC	32.75	11.25	AST Research Inc.	19.50	-2.50	-11.36
NYS	9.38	4.00	Bolt, Beranek & Newman	5.88	0.75	14.63
NYS	21.63	6.63	Commodore Int'l	14.50	0.75	5.45
NYS	74.25	27.88	Compaq Computer Corp.	27.88	-2.38	-7.85
OTC	2.63	0.38	Computer Automation Inc.	1.63	0.13	8.33
NYS	13.75	6.75	Control Data Corp.	9.25	-0.38	-3.90
NYS	19.75	8.38	Convex Computer	10.88	-1.13	-9.38
NYS	47.50	24.75	Cray Research Inc.	47.50	2.13	4.68
NYS	22.50	3.50	Data General Corp.	16.75	-3.25	-16.25
NYS	4.38	1.00	Datapoint Corp.	3.13	0.00	0.00
OTC	36.25	11.00	Dell Computer Corp.	22.63	-4.63	-16.97
NYS	83.00	46.50	Digital Equipment Corp.	61.88	0.50	0.81
NYS	28.88	16.13	Harris Corp.	24.38	-1.75	-6.70
NYS	56.63	24.88	Hewlett Packard Co.	50.00	-0.25	-0.50
NYS	139.75	94.00	IBM	98.38	0.50	0.51
OTC	12.00	7.75	Information Int'l	9.25	-0.25	-2.63
NYS	145.75	106.00	Matsushita Electronics	117.75	2.00	1.73
OTC	20.88	7.25	MIPS Computer Systems	10.00	0.63	6.67
NYS	110.00	44.50	NCR Corp.	108.00	0.00	0.00
OTC	29.50	10.75	Pyramid Technology	14.63	-1.63	-10.00
OTC	20.00	7.50	Sequent Computer Sys.	12.88	1.63	14.44
NYS	47.25	18.25	Silicon Graphics	43.50	2.13	5.14
NYS	45.88	18.25	Stratus Computer Inc.	42.63	2.63	6.56
OTC	38.63	16.88	Sun Microsystems Inc.	24.00	-0.25	-1.03
NYS	17.63	9.13	Tandem Computers Inc.	12.00	-0.13	-1.03
OTC	4.75	1.25	Tandon Corp.	1.94	-0.13	-6.06
NYS	36.50	23.38	Tandy Corp.	27.88	-0.25	-0.89
OTC	24.50	6.75	Teradata	20.50	1.13	5.81
NYS	6.13	1.38	Ultimate Corp.	2.50	-0.38	-13.04
NYS	7.00	2.00	Unisys Corp.	4.25	0.13	3.03
ASE	5.75	2.00	Wang Labs Inc. (b)	2.50	-0.25	-9.09
Software & DP Services						**Up 4.29%**
OTC	63.00	17.00	Adobe Systems Inc.	51.25	1.63	3.27
OTC	12.25	3.50	Aicorp	4.63	-0.25	-5.13
OTC	59.88	23.13	Aldus Corp.	41.50	0.50	1.22
OTC	28.50	14.13	American Mgmt. Systems	19.00	0.50	2.70
OTC	17.25	9.00	American Software Inc.	16.25	2.00	14.04
NYS	4.63	1.50	Anacomp Inc.	3.13	0.00	0.00
OTC	18.25	11.88	Analysts Int'l	14.50	-1.38	-8.66
OTC	13.00	4.38	ASK Computer Sys.	12.88	1.75	15.73
OTC	39.75	25.00	Auto Data Processing	37.25	0.13	0.34
OTC	62.25	39.75	Autodesk Inc.	42.00	-0.50	-1.18
OTC	35.50	18.50	BGS Systems Inc.	34.25	0.50	1.48
OTC	59.88	19.13	BMC Software Inc.	59.88	7.38	14.05
OTC	16.00	8.75	Boole & Babbage Inc.	12.00	0.13	1.05
OTC	69.75	23.88	Borland Int'l	69.75	21.75	45.31
OTC	20.88	6.63	Cognos Inc.	13.38	1.38	11.46
NYS	11.13	6.25	Computer Associates	9.50	0.50	5.56
OTC	17.75	9.00	Computer Horizons	10.50	0.88	9.09
NYS	73.25	43.25	Computer Sciences	66.88	-0.13	-0.19
NYS	11.25	6.63	Computer Task Group	8.13	-0.63	-7.14
OTC	22.75	13.00	Comshare Inc.	14.75	0.00	0.00
OTC	13.25	4.75	Corporate Software	11.25	1.13	11.11
NYS	54.63	32.25	General Motors E (EDS)	54.25	1.63	3.09
OTC	18.75	7.75	Goal Systems Int'l	10.63	-0.13	-1.16
OTC	7.00	1.88	Hogan Systems Inc.	5.63	-0.13	-2.17
OTC	29.25	8.50	Information Resources	24.63	2.13	9.44
OTC	15.50	2.63	Informix Corp.	15.50	1.75	12.73
OTC	3.63	1.13	Intellicorp Inc.	1.13	-0.41	-26.52
OTC	31.50	10.75	Intergraph	20.25	1.50	8.00
OTC	9.13	3.00	Interleaf Inc.	8.75	-0.13	-1.41
OTC	14.63	6.88	Intersolv	14.63	1.38	10.38
OTC	43.25	10.50	Knowledgeware Inc.	11.38	0.38	3.41
OTC	45.00	17.25	Legent Corp.	32.25	-0.50	-1.53
OTC	40.75	14.75	Lotus Development	25.00	-2.50	-9.09
OTC	19.00	10.25	Mentor Graphics	14.25	0.50	3.64
OTC	32.00	9.75	Microgratx	16.50	1.25	8.20
OTC	92.75	42.00	Microsoft Corp.	92.63	3.13	3.49
NYS	15.75	4.00	On Line Software Int'l	15.75	0.00	0.00
OTC	16.25	5.50	Oracle Systems	16.25	0.88	5.69
NYS	16.25	7.00	Pansophic Systems	16.25	0.38	2.36
OTC	10.00	1.25	Phoenix Technologies	8.63	1.88	27.78
OTC	23.50	9.00	Platinum Technology	16.00	-1.75	-4.00
NYS	58.88	36.00	Policy Management Sys.	58.88	4.13	7.53
NYS	29.63	11.63	Reynolds & Reynolds	29.63	3.38	12.86
OTC	14.25	6.75	Ross Systems	14.25	2.00	16.33
OTC	27.50	15.50	SEI Corp.	23.00	0.00	0.00
OTC	23.38	13.88	Shared Medical Systems	21.13	-0.25	-1.17
OTC	35.25	13.25	Software Publishing Corp.	14.00	-0.38	-2.61
NYS	19.00	6.75	Sterling Software	18.50	0.25	1.37
OTC	18.25	9.88	Sungard Data Sys.	17.00	-0.25	-1.45
OTC	35.25	9.88	Symantec Corp.	31.75	-2.13	-6.27
NYS	13.75	4.50	System Center Inc.	12.50	-0.13	-0.99
OTC	37.25	12.50	System Software Assoc.	26.75	7.00	35.44
Semiconductors						**Up 2.13%**
NYS	14.25	3.75	Advanced Micro Devices	12.25	1.75	16.67
NYS	12.50	5.50	Analog Devices Inc.	9.13	0.13	1.39
OTC	13.50	6.00	Chips & Technologies	8.00	0.13	1.59
OTC	59.25	34.00	Intel Corp.	41.88	-0.63	-1.47
NYS	12.50	5.38	LSI Logic Corp.	7.88	0.13	1.61
NYS	19.13	6.75	Micron Technology	16.75	0.13	0.75
NYS	71.25	45.75	Motorola Inc.	61.88	-0.63	-1.00
NYS	8.38	3.25	National Semiconductor	5.88	0.63	11.90
NYS	47.63	25.00	Texas Instruments	30.88	0.88	2.92
OTC	12.25	3.50	VLSI Technology	7.88	1.13	16.67
OTC	16.75	5.50	Weitek	5.88	-0.88	-12.96
ASE	6.75	2.50	Western Digital Corp.	2.63	-0.38	-12.50
Peripherals & Subsystems						**Up 2.96%**
OTC	2.75	0.88	Apertus Technologies	1.38	0.00	0.00
OTC	17.00	7.50	Banctec Inc.	15.75	0.25	1.61
OTC	23.50	5.50	Cambex Corp.	23.25	1.25	5.68
ASE	11.75	5.13	Cognitronics Corp.	8.63	-0.38	-4.17
NYS	31.25	14.75	Conner Peripherals	15.38	0.13	0.82
ASE	18.38	7.00	Dataram Corp.	15.63	1.50	10.62
NYS	13.00	4.88	EMC Corp.	9.50	0.50	5.56
NYS	47.25	37.63	Eastman Kodak Co.	44.88	-1.00	-2.18
OTC	11.25	4.88	Emulex Corp.	6.75	0.25	3.85
OTC	24.00	14.00	Evans & Sutherland	18.00	0.00	0.00
OTC	8.38	4.00	Iomega Corp.	8.38	0.38	4.69
OTC	28.25	8.25	IPL Systems Inc.	19.13	0.88	4.79
OTC	6.25	1.63	Maxtor Corp.	5.13	0.13	2.79
OTC	18.00	5.50	Micropolis Corp.	7.88	1.13	16.67
NYS	97.50	78.25	3M Corp	91.38	1.63	1.81
OTC	10.75	5.75	Printronix Inc.	6.00	0.25	4.35
NYS	26.75	11.13	QMS Inc.	23.75	0.50	2.15
OTC	18.25	9.13	Quantum Corp.	9.50	-0.13	-1.30
NYS	8.00	4.38	Recognition Equipment	7.25	0.00	0.00
OTC	11.50	4.88	Rexon Inc.	7.25	0.00	0.00
OTC	19.88	7.13	Seagate Technology	8.25	0.50	6.45
NYS	51.50	15.75	Storage Technology	39.50	0.25	0.64
NYS	30.88	15.63	Tektronix Inc.	23.38	1.25	5.65
OTC	0.53	0.16	Televideo Systems	0.25	0.00	0.00
NYS	63.88	30.88	Xerox Corp.	63.88	2.88	4.71
Leasing Companies						**Up 1.68%**
OTC	16.25	7.50	Amplicon Inc.	14.63	0.13	0.86
NYS	28.38	15.13	Comdisco Inc.	23.75	-0.25	-1.04
OTC	15.75	8.88	LDI Corporation	15.50	1.00	6.90
OTC	4.50	2.25	Selecterm Inc.	3.25	0.00	0.00

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UNIX EXPO SHORTS

Airline lands excellence award

American Airlines and its subsidiary, American Airlines Decision Technologies, received the first annual International Award for Excellence in Open Systems, given by the Unix Expo show sponsors. The airline won for its Integrated Capacity Planning System, which schedules aircraft for more than 4,500 daily departures to 270 destinations worldwide.

Wordperfect tips Unix hand

Wordperfect Corp. demonstrated Wordperfect Version 5.1. Scheduled for year-end release, it will offer a graphical user interface upgrade for Unix systems. Also slated to ship late this year is the next release of Wordperfect Office for Unix.

User groups duck under umbrella

The Uniforum Association and the European Forum for Open Systems said they will form the World Forum of Open Systems Users to provide an umbrella group for all "national user groups dedicated to the promotion of open systems."

Standards crawl forward

Unix International said that half the interface specifications for its Unix International-Atlas framework will be available by the first quarter of 1992, with the rest coming out by 1993. The second batch will include an application programming interface, Unix International's desktop manager and additional transaction processing interfaces. Separately, Intel Corp. announced the availability of test suites to check out compliance with the IABI standard, which is essentially Unix System V Release 4 on Intel platforms.

Mips RISC box rockets

Mips Computer Systems, Inc. unwrapped a new reduced instruction set computing (RISC)-based box, as well as an enhanced version of RISC/OS 5.0, its multiprocessor Unix software. The RC6380-100/400 Riscomputer features fully symmetric multiprocessing and the R6000A microprocessor. Pricing starts at $196,000.

Migration, security focus of Unix show

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Nary a "techie" was in sight at last week's Unix Expo International trade show, which highlighted a user trend of moving certain new applications on the Unix machines but leaving the mainframe more or less intact, at least for the time being.

Other hot show topics included migration from proprietary platforms, systems administration and security.

Hewlett-Packard Co. and Computer Associates International, Inc. jointly announced a suite of Unix systems administration, database and software development tools, while NCR Corp. took the wraps off its own systems administration package.

As a result of these kinds of introductions, talk at the show centered firmly on *how* Unix can assist commercial sites, not *if* it can.

For example, managers and executives at such commercial information systems shops as Salomon, Inc., Teacher's Insurance, The Automobile Association of America and others, spoke about their experiences in moving to a Unix environment, including the tools they used and why they made the move.

UNIXEXPO INTERNATIONAL

Duane Elms, a member of the corporate staff at General Electric Co. in Bridgeport, Conn., echoed the comments of other users: "We have just about every kind of computer ever made. If anybody needs open systems, we do."

Still, some users said they remain skeptical about whether Unix is ready to take the place of proprietary systems in running an enterprisewide network, saying that Unix by and large lacks commercial-grade features such as systems management and security.

Those were the issues that vendors said they sought to address with announcements that included the following:

- A suite of systems management, database and software development tools jointly announced by HP and CA. The database management system, software development tools and applications are available for HP computers as well as a host of competitive systems.
- NCR's own systems management software for the NCR 3000 family, which is based on Unix System V Release 4 and includes a graphical user interface (GUI) to simplify tasks such as job scheduling and job monitoring.
- A joint initiative from IBM and HP to further develop and push as an industry standard HP's Broadcast Message Server, which is a facility to allow computer-aided software engineering (CASE) tools to share information.
- Upgraded Unix CASE products from Digital Equipment Corp., including a facility to integrate other tools into its Fuse product family and support for the C++ programming language.
- Release 1.1 of The Santa Cruz Operation's SCO Open Desktop Development System, software with which to create a GUI environment.
- Unix financial and accounting applications from CA, Fourgen Software, Inc. in Edmonds, Wash., and Dynamic Business Systems in Alexandria, Va.

IBM, Apple outline RISC chip production schedule

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — IBM and Apple Computer, Inc. last week provided additional details of their far-reaching alliance, revealing that initial reduced instruction set computing (RISC) chips needed to power their jointly developed hardware platform will come out in 1993.

"They'll be coming off-line in 18 to 24 months and will be in systems about six months after that," said Bill Filip, an IBM vice president and president of the Advanced Workstation Division.

The schedule will likely not change the mid-1990s time frame provided earlier by IBM and Apple for actual delivery of Power PC architecture systems.

Tom Whiteside, IBM's manager of the Custom Design Center, where IBM is building the RISC chips with Motorola, Inc., cautioned that IBM will produce sample chips first, and "then it's really a function of how long it takes the system houses to put them into real, live systems."

IBM and Apple provided an overview of their alliance at the Unix Expo International trade show here last week. In addition to outlining the chip production schedule, the firms indicated that the other major components of their alliance are on schedule. For instance, Filip said, some application programming interface specifications for developers should be published early next year for the Power Open system environment based on IBM's AIX, Apple's Macintosh and the Power PC architecture.

James Norling, president and general manager of the semiconductor products sector at Motorola, said a "definition of price points" for the Power PC architecture will be released this week. However, Whiteside said, "we won't go into detail or give actual pricing."

Norling said 100 engineers are currently working at the Austin, Texas, facility.

Nextstep moves Next into corporate sights

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — Next Computer, Inc. founder Steven Jobs conceded last week that his company's first workstation "didn't succeed well" but claimed the sleek black box is on the threshold of commercial success.

"Having been through this before, I can feel the rumble coming," Jobs said at a press conference following his keynote address at the Unix Expo International trade show here last week. "We've done a lousy job telling people about what we have, but word is starting to get around."

In part, Jobs is referring to the Nextstep development environment, which he claims is starting to attract users interested in developing mission-critical applications.

"When we did the Mac, we didn't anticipate desktop publishing because we weren't smart enough," Jobs said. "With Next, we weren't smart enough to see the need for development of mission-critical customized applications."

Jobs insisted that earlier problems — which included high prices, narrowly targeted marketing and a lack of software — are behind it. He predicted Next will sell about $60 million worth of systems this quarter, which would bring annual sales to about $150 million, based on industry estimates. Taking an even more aggressive posture, Jobs then claimed Next will "definitely go public within the next 18 months."

Robert Holmgren

Next's Jobs *acknowledges past problems but sees glowing future for his stylish workstation*

Industry analysts said Next has scored some points in the corporate world this year. However, they were not quite as optimistic as Jobs, noting that the company has fierce competition in the workstation market and is still dogged by an identity crisis.

"There's no doubt in my mind the he has an exceptional product that's very competitive," said Tim Bajarin, executive vice president of Creative Strategies Research International, Inc. in Santa Clara, Calif. "The problem is, he's competing this time around with some of the strongest forces he could have ever imagined, with Microsoft and [the Advanced Computing Environment], IBM and Apple and, on top of that, Sun Microsystems, Inc. and Hewlett-Packard Co."

According to John Dunkle, president of Workgroup Technologies, Inc. in Hampton, N.H., Next has made progress with specific niches within the corporate world.

Users plan E-mail-enabled applications

Interconnection standards allow electronic mail to break conventional messaging barriers

BY ELLIS BOOKER
CW STAFF

NEW ORLEANS — Conventional notions about electronic mail are headed for the dead-letter bin.

Thanks to interconnection standards such as X.400 and a crop of vendors offering products that transparently link dissimilar systems, E-mail is becoming more practical. Now, users of private and public E-mail are spending more time exploring ways to evolve their E-mail networks into vital application platforms for their businesses.

"We want to take E-mail beyond messaging," said Peter Rakoczy, manager of office systems development at Royal Bank in Toronto. He said he envisions a loan application moving through various personnel and software systems via an automated E-mail application.

Rakoczy was one of a few hundred attendees here last week for Electronic Messaging '91, a conference hosted by the Electronic Mail Association.

The topics of "mail-enabled" applications and alternative means of delivering mail were two of the hot issues at the conference. Yet plenty of problems with E-mail interconnection have yet to be resolved.

For instance, although growing numbers of E-mail networks are being interconnected, users still face the daunting job of addressing messages across multiple systems.

Take Washington, D.C.-based Marriott Corp., where the 4,000 or so E-mail users belong to six separate directories. "Before we go to X.400, we need to have a nailed-down, rock-solid naming standard," said Robert Webb, an information systems consultant at Marriott.

However, X.500, the directory standard companion to X.400, is still far from being codified, and large-scale X.500 testing is not planned until next year. Pragmatic vendors have jumped into this gap with products that "synchronize" two or more directories.

Last week, for example, Soft-Switch, Inc. said it would become the first vendor other than IBM to support IBM's shadowing protocol for Enterprise Address Book, IBM's director for all Officevision platforms.

Soft-Switch's IBM host software already supports interconnections among more than 40 proprietary E-mail systems, as well as open protocols such as X.400 and the Simple Mail Transfer Protocol.

Meanwhile, AT&T Easylink Services said it would roll out a global, on-line directory of Easylink subscribers by the end of the year. Separately, AT&T announced a Microsoft Corp. Windows-based front end to its public E-mail network.

AT&T also announced an alliance with on-line database provider Mead Data Central, Inc. to send news and financial reports to Easylink subscribers on an ad hoc basis or according to a profile of interests set up by the subscriber.

Finally, British Telecommunications PLC unveiled an international X.400 backbone expected by January, which will consolidate its U.S., UK and French networks.

One company that has succeeded in moving E-mail in the direction of work-flow automation is Hughes Aircraft Co.

Peter W. Donaghy, manager of the customer service and support laboratory at Hughes, tried the approach with three formerly paper-based processes. The notable improvement was a quicker cycle time.

Donaghy said a rental car requisition system went from taking an average of three days to taking minutes, and a formerly paper-based news-clipping service now delivers information from internal and external news to E-mail accounts in one day instead of two weeks.

It's in the mail

One of the largest studies of E-mail use to date indicates big business will continue its rapid deployment of the technology.

"We determined there are 8.9 million users among Fortune 2,000 companies today and that this universe will grow to 15.6 million by 1993," said Heidi Bomengen, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass., who co-chairs the Electronic Mail Association's (EMA) Research and Statistics Committee.

Bomengen shared preliminary results of the survey at the EMA's Electronic Messaging '91 conference last week in New Orleans. Among the key findings were the following:

- Over 70% of the sites with more than 1,000 employees use E-mail; 50% of those sites with more than 500 employees use it.
- The vast majority of E-mail traffic is inside a single company, although most of this goes "off site." Only 3% to 5% of the traffic is interenterprise — that is, going between companies.
- International traffic is small, representing only about 3% of the traffic.

The EMA study also predicts that by 1995, the number of E-mail messages sent annually will increase fourfold, to around 25 billion.

The EMA study was based on U.S. and Canadian Fortune 2,000 firms with more than $500 million in annual revenue and involved some 2,000 interviews.

The EMA plans to release the details of its survey in early December.

ELLIS BOOKER

Security features may up business messaging

BY JOANIE M. WEXLER
CW STAFF

The industry is nearing the first widespread deployment of secured electronic mail, which could encourage companies to boost their use of electronic media for conducting business.

A working group of the Internet Engineering Task Force (IETF) said it has created security add-ons for Transmission Control Protocol/Internet Protocol (TCP/IP) networks. The features, including digital signatures and encryption, are currently in beta testing at companies attached to the 1.4 million-node Internet, the worldwide scientific and educational network now gaining commercial use.

Products offering some measure of secured E-mail could be on the market in about a month, a working-group official said.

Need for privacy

One would-be user attested to the need for what the working group has named Privacy Enhanced Mail (PEM). "This effort impacts the whole TCP/IP community," said Bill Riess, a supervising engineer in the Information Technology Department at Commonwealth Edison in Chicago. Riess said such features as digital signatures would let him know an electronic work request or purchase order came from the person it appeared to come from.

"If such safeguards were in place, we would consider doing much more electronic business," Riess said.

"Millions of unencrypted messages pass over the Internet every day that currently can be forged," noted Mitch Kapor, president of the Electronic Frontier Foundation. The Cambridge, Mass.-based nonprofit organization is concerned with spurring the development of a national telecommunications network and addressing the legal ramifications of electronic communications.

Kapor is also a pioneer of the Commercial Internet Exchange, a subset of the Internet for commercial users trying to conduct business over it. "There is a natural concern over information that has economic value," barring many from using the network, he said.

"Companies are starting to communicate electronically with suppliers and distributors and are looking to the Internet as a common way to do business," said Mike Kendall, product marketing manager of secure systems at Digital Equipment Corp., a member of the Internet working group. This makes secured E-mail more of an issue, he noted.

According to the working group, which intends to forward PEM to the IETF for standards approval, versions have already been constructed and demonstrated for Unix, MS-DOS and Apple Computer, Inc. Macintosh platforms.

Jeffrey Schiller, network manager at MIT and designer of the Macintosh PEM version, said vendors are working on PEM versions, adding that it "is safe to say that PEM will show up bundled into certain vendor products within a month."

Working group Chairman Stephen Kent, who is also chief scientist at BBN Communications, Inc., the firm that manages the Internet, explained that the security features prevent message tampering and provide assurance that messages are actually from the apparent sender, as well as a combination of public- and private-key encryption and nonhuman fail-safe methods of issuing passwords.

Lotus offers Open Look interface for Sparc

BY CHRISTOPHER LINDQUIST
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. last week unwrapped a graphical user interface for users of its 1-2-3 for Sun Sparc Systems Version 1.1. The spreadsheet maker added a Unix System Laboratories, Inc. Open Look interface in response to user requests.

Lotus said the Open Look version of 1-2-3 is compatible with all previous versions, including those for DOS and other Sun Microsystems, Inc. Sparcstation versions.

The product includes support for the X Window System; a Sybase, Inc. SQL Datalens Driver that allows mainframe SQL connectivity; the recently announced Lotus Realtime, which allows real-time financial data to be fed to 1-2-3 spreadsheets; and the Lotus C Add-in Toolkit.

The product is scheduled to ship within 90 days. Anyone who buys 1-2-3 for Sun Sparc Systems Version 1.1 after Oct. 30 can receive the Open Look interface at no charge.

Media Edition users who bought the package between June 10 and Oct. 29 can receive an upgrade kit for $40. Node Edition users can get the Open Look interface documentation at no charge.

The current list price of 1-2-3 for Sun Sparc Systems is $695 per license. Future shipments of 1-2-3 for Sun Sparc Systems will include the Open Look interface.

Lotus 1-2-3 for Sun Sparc Systems requires a Sun-4 Sparcstation running SunOS Release 4.1.1 or higher, 12M bytes of random-access memory and 10M bytes of hard disk space.

The product also requires Openwindows 2.0, running either Sunview or Open Look, or X/11 Release 4.

Tandem RISCs lower prices

Economy may undermine overall purchases as users reassess needs

BY JEAN S. BOZMAN
CW STAFF

PHOENIX — The RISC technology announced last week by Tandem Computers, Inc. should reduce the entry price for fault-tolerant computing.

Users said it is only a matter of time before similar price reductions trickle up to Tandem's complex instruction set computing (CISC)-based Cyclone mainframes.

However, these pricing trends may do little to stem the recent slide in Tandem's profitability [CW, Oct. 28]. Not only might the new reduced instruction set computing (RISC) machines eventually undermine sales of the older CICS Cyclones, but overall Tandem sales might also take a hit if users constrained by budgetary woes close their wallets.

Many of the 800 attendees at the International Tandem Users Group (ITUG) meeting here last week said they anticipate installing the RISC-based machines at their sites by early 1992. However, some added that financial concerns could delay implementation. Moreover, the users added that shrinking information systems budgets have already put purchases of the high-end CISC-based Cyclone mainframes on hold.

"I think the recession is the key," said Al Smith, deputy director of the Teale Data Center in Sacramento, Calif., the state of California's largest data center, which has a large Cyclone system. "There just aren't as many people willing to commit $10 million to $15 million for a system as there used to be."

Cyclone strategies

Smith, who did not attend the ITUG meeting, said he plans to acquire a second Cyclone soon. He has two strategies: wait and see if prices fall on the older technology, or wait until the RISC technology moves into the high-end Cyclone. Either way, he said, he wins.

"My guess is that they've got some time to keep selling Cyclones as they are, but that they will have to position RISC-based Cyclones to be competitive with other [on-line transaction processing] computers by 1993."

In fact, Tandem executives said that the firm had been forced to provide heavy discounts for the older CISC-based machines during 1991. Discounts have been as high as 40% to 50% off list price. The discounting affected Tandem's profitability — and led the $1.9 billion firm to reduce its 11,000-person work force by nearly 300 through attrition over the last two quarters.

Other users are less optimistic. "I'm frustrated," said one East Coast user who works for a military contractor. Noting that the new RISC products are attractive, he said he wanted to buy the CLX/R machines but doubts it will happen because the purchase is not budgeted.

Another East Coast user, who works at a government facility with existing CLX/Rs, also cited budgetary constraints.

Gerald Petersen, Tandem's senior vice president of marketing, said the RISC-based computers are supposed to put the users on a new price/performance curve that would boost overall sales. "We recognize that MIS directors are under huge pressure to cut the cost of their IS infrastructure," Petersen said. "We're going to have to sell a few more absolute units, but we'll be under less pressure to discount."

Tandem is working with 140 software vendors to provide packaged applications for the RISC machines.

Need for 32-bit chips

At Monday's announcement at Tandem headquarters in Cupertino, Calif., Tandem Chief Executive Officer James Treybig acknowledged the need to use the R4000 32-bit RISC chip from Mips Computer Systems, Inc. in high-end Cyclones. "We're going to put it in the Cyclone," Treybig said. "We're just not going to say when."

He added that Tandem was struggling to move forward during the recession. "We'd like to have higher profits than we've had, but we're trying to have a balance between keeping our people and our development programs in place and making profits."

Tandem said fourth-quarter earnings had fallen to $2.8 million, compared with $31.8 million at the same time last year.

Some users here said they are ready to install the new RISC systems within weeks. Hugh Thompson, information technology manager at the Northumbria Police District in Northeastern England, said he installed a six-processor Cyclone/R two weeks ago. "We'll go live by next Sunday."

Northumbria plans to run its applications without change on the new system, but they have been recompiled to optimize them for use on the RISC machine.

Northumbria tests showed the Cyclone/R to be nearly three times as powerful as the older TXP processors Thompson had been using for six years. Police reports and 911 dispatching in the area surrounding Newcastle-on-Tyne generate 225,000 transactions per day, prompting a need to expand from an eight-processor TXP system to the equivalent of 14 TXP CPUs.

The new Cyclone/R will provide the equivalent of 18 TXP CPUs, Thompson said.

California makes clear vision with IBM multimedia system

BY CLINTON WILDER
CW STAFF

SACRAMENTO, Calif. — California's state agencies have teamed up with IBM to develop a multimedia-based public information system that they liken to a "government automated teller machine."

Dubbed Info/California, the system employs a touch-screen interactive display in a public kiosk where citizens can call up textual, graphic, audio and video information from several state agencies. Users can file public employment applications on the system and will eventually be able to use the system to apply for driver's licenses, public assistance programs and other government services.

"The system allows people with a minimal literacy level to see and hear a lot of valuable information," said Ken Moody, deputy director of IS at the California Health and Welfare Agency, which runs the data center housing most of the information available on Info/California.

Although IBM recently unveiled a raft of digital video interactive multimedia products, Info/California does not use them because of budget constraints on the project, said IBM account manager John Allen. Instead, the system building blocks, such as Personal System/2 Model 70s with M-Motion cards, are components that were available when IBM began the project last February. Multimedia supplier North Communications in Santa Monica, Calif., developed software for the project.

The system's pilot phase, begun late last month, placed 15 kiosks in public buildings, stores and malls in the Sacramento and San Diego areas. Phase two will introduce more applications and upgraded technology at those locations before Info/California will be considered for expansion to other cities. That decision will be made in about nine months.

Info/California could put a variety of state-of-the-art multimedia technologies to everyday use, but the pilot phase is fairly simple, given funding limits. California has put about $300,000 into the project. IBM, under a 1988 California law that allows vendors to fund new public technology ventures, has spent more than $1 million.

PS/2s in each kiosk are equipped with M-Motion cards, an IBM product that was introduced in 1990 that allows audio and video from an attached laser disc player to be mixed through the motherboard.

Utility snubs IBM blueprint

CONTINUED FROM PAGE 1

excessively complicated."

Delmarva chose the converse approach: linking IBM mainframes to LANs and then interconnecting the LANs over a backbone of Wellfleet Communications, Inc. routers.

"I can move a lot more frames per second per dollar with Wellfleet routers than I can do via 3745s [IBM front-end processors], plus I don't have to pay exorbitant software charges to IBM," Scoggin said.

In creating a LAN-based internetwork and then putting SNA protocols on top of it, Delmarva is implementing a strategy that most enlightened Fortune 500 firms will soon follow, according to David Passmore, a principal at Ernst & Young. However, with the exception of technological pioneers such as The Travelers Corp., most companies are still at the planning stage, he added.

Delmarva's information systems department, which describes itself as "typical IBM and pretty conventional," has no problem with network operations' unorthodoxies, as long as everything still looks like typical SNA to the mainframes, said Duane Taylor, the utility's vice president of IS.

Delmarva took a further turn away from the IBM mainstream by eliminating most of its Token Ring LANs, Scoggin said. "Token Ring was expensive, hard to maintain and cost more per port than 10Base-T, which is what we have now," he added. The 10Base-T standard supports 10M bit/sec. Ethernet transmissions over unshielded twisted-pair wiring.

One step off the beaten path led to another: Delmarva's move to Ethernet forced it to move away from IBM communications controllers, which at the time did not support the LAN protocol. The company first became a beta-test site and then a major customer for McData Corp.'s IBM-compatible controllers, which link SNA devices and hosts to Ethernet.

Delmarva's network management strategy was also twisted inside out from IBM's point of view. Instead of making IBM's host-based Netview its central management system, Delmarva is making Netview one of several management systems that report alerts to an internally developed network management console, Scoggin said.

"We're not big fans of Netview: The human interface is strange," Scoggin said. Actually, Delmarva felt that none of the available integrated management platforms could provide the functionality it wanted "at a price we could do it for," Scoggin added.

The utility has hired computer science majors from the University of Delaware to develop a console that will be based on the Open Software Foundation's Motif and X Window System, Scoggin said.

Ironically, IBM is busily filling in the gaps that caused Delmarva to turn elsewhere for its network and network management needs. The vendor now offers a friendlier Netview interface through its Graphics Monitor Facility.

The 3172 controller, available for about a year, links SNA devices to Ethernet. The 3745 will support direct links to Ethernet in about a year.

AT A GLANCE:
Delmarva Light and Power Co.

Headquarters: Wilmington, Del.

Business: Delmarva is the power utility for all of Delaware and parts of Maryland and Virginia.

1990 Revenue: $811.2 million.

Employees: 2,755 (1990).

IS: 130 employees.

Network operations: Staff of nine.

'Brain barriers' limit IS change

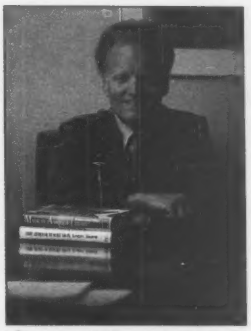
BY SALLY CUSACK
CW STAFF

ORLANDO, Fla. — Information technology-based efforts designed to spur the U.S. industrial recovery will be limited more by "brain barriers" than by any other factor.

Many U.S. corporations are reluctant to change business practices and procedures that have been in place for decades by introducing innovative approaches to information technology, according to analysts speaking at last week's Gartner Group, Inc. annual convention here.

Despite this reluctance to embrace new ways, U.S. businesses must boost productivity by harnessing evolving high-technology manufacturing processes, said Lester Thurow, an economist at MIT's Sloan School of Management.

This means developing new process technology for integrating front- and back-office processing with manufacturing systems. U.S. corporations will need a change of mind-set because many companies have traditionally lavished heavy attention on corporate marketing and sales, Thurow noted.



Thurow: *U.S. companies will need a change of mind-set*

Information technology, therefore, must deliver direct, visible and tangible results in terms of productivity improvements and profitability, said William C. Rosser, vice president of Industry Service at Gartner Group.

Rosser cautioned that "the only path" is for IS management to develop systems that improve competitiveness. "End users must play a key role in this process," he said, "and corporate IS policies must include the concept of a self-directed work team."

The use of "groupware" for information sharing and "decisionware" for communicating decisions and organizational boundaries will help make this happen.

To fully and effectively implement work-flow management, however, the U.S. must overcome middle management's traditional opposition to technology, Rosser said. "Management must shift its style toward coordination instead of control."

Novell fix speeds traffic

CONINUED FROM PAGE 1

1,024K-byte packet size," he said. "I run an image-processing application on the network that transmits 4K-byte packets," causing a bottleneck.

Collins said a Novell engineer told him that Burstmode IPX would let him scale transmissions to a larger packet size and "communicate 4K-byte packet sizes to both my image system and Netware file server in real time."

"My bottleneck right now, to a certain extent, is Netware, so this is absolutely needed in my opinion," said Laura Swanton, manager of technical services at Bryant/Universal Roofing, Inc. in Phoenix and president-elect of Netware Users International. "I'm living in a wide-area world now. Applications developers have told me that cleaning up the uncompiled IPX code would make it run faster."

Enhancements in wide-area networking are topping user wish lists as their companies move to interconnect high-speed LANs over traditionally much slower wide-area communications links.

Burstmode IPX would address that trend and join other Novell efforts to shift the firm's emphasis from departmental to enterprise LAN provider.

As such, Burstmode IPX would enable Novell to challenge Banyan Systems, Inc. for dominance of large-node networks, observers noted.

Novell's Netware network operating system's strength to date has been mainly in small file requests to servers, according to Craig Burton, president of Clarke-Burton Corp., a Salt Lake City-based research and consulting firm.

Leveling trade-offs?

Burton, who said he is familiar with Burstmode IPX, said IPX has not been very efficient in downloading large packets or boosting wide-area throughput. "With Burstmode IPX, Novell is attempting to level the trade-offs," he said.

There are conflicting opinions on whether existing multiprotocol routers would have to be altered to support Burstmode IPX. Burton said a Netware server running both "regular" and Burstmode IPX can "coexist on the same wire, so I don't know if the change will impact routers." However, Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., commented that "any network element that processes at that level has to be changed."

The government Netware user, who is also shopping for multiprotocol routers, said he heard that several multiprotocol routers are in the process of being certified by Novell for Burstmode IPX support. "Novell certification is important to us because we want it to be clear whose fault it is if something hangs up in the network," he said.

A spokesman from router market leader Cisco Systems, Inc. said that as Novell's internal router supplier, "We passed certification tests for Burstmode IPX six months ago." Main router rival Wellfleet Communications, Inc. said it is not familiar with Burstmode IPX.

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Apple gains key access ally

CONTINUED FROM PAGE 1

Macintosh users said Apple's efforts to beef up corporate connectivity are beginning to pay off. At Hughes Aircraft Co.'s Ground Systems Group in Fullerton, Calif., 80% of the personal computer purchases are Macintoshes, up from about 50% only two years ago. Why?

"The Mac is a much better corporate citizen than it used to be; now it can be hooked up to almost everything," said Mary Howlett, manager of management information technologies.

Officials at New York-based Information Builders said they also have other Macintosh connectivity products in the works. Company engineers are working on a product that combines the Macintosh's graphically oriented screen icons with the underlying code of Information Builders' PC/Focus applications development environment. Called Macfocus, the product is expected to ship next year.

Separately, Apple's much ballyhooed alliance with IBM promises to introduce products that will greatly boost the ability of Macintosh and IBM PCs to interact. They include a blueprint for a next-generation Unix system that will merge IBM's AIX Unix, the Macintosh interface and a powerful new microprocessor as well as plans for a suite of connectivity products that will begin arriving by the end of the year.

The result is the opening up of opposing platforms to those who have longed cringed at mixing them. "We had dismissed Apple in the past, but this could open our eyes," said Joseph Vallorosi, assistant vice president of information systems at electrical utility Consolidated Edison Co. of New York, Inc.

Apple is aggressively branching out in its efforts to tap into a variety of databases. An important step was taken earlier this year when the Cupertino, Calif.-based firm announced its first licensing agreements for its Data Access Language (DAL), a connectivity language that allows PC users to access relational database information from the server host [CW, April 1].

> "WE HAD DISMISSED Apple in the past, but this could open our eyes."
>
> JOSEPH VALLOROSI
> CONSOLIDATED EDISON

DAL licensing arrangements have since been signed with Computer Associates International, Inc.; Novell, Inc.; Tandem Computers, Inc.; Data General Corp.; Blyth Software, Inc.; and Pacer Software, Inc.

Stardent moves to software; seeks to sell hardware lines

BY J. A. SAVAGE
CW STAFF

CONCORD, Mass. — With a nod to the adage that software is king, Stardent Computer, Inc. took steps last week to shed its hardware core and reshape itself as a software provider.

"It is becoming extremely difficult, if not impossible, for a small entrepreneurial company to effectively compete as a supplier of computer hardware systems," John W. Poduska Sr., Stardent's chairman and chief executive officer, said in a written statement.

Bowing to continued pressure in the graphics supercomputer market, the 6-year-old manufacturer said last week that it is selling its hardware business to partner Kubota Pacific Computer, Inc.

What remains of Stardent will form the basis of a new software company, called AVS, Inc., that will market software to develop visualization applications.

A restructuring and downsizing of the company will result in the spin-off or acquisition of three business units overall.

The company said it will cooperate with a new venture that will be established by current Stardent employees to provide continued worldwide maintenance and support of Stardent's installed base of approximately 500 GS series systems.

The proposed and pending transactions will be subject to shareholder approval and are expected to be completed by the end of December.

Kubota's parent company, Kubota Ltd., which through Kubota Pacific has supplied Stardent with its Titan series of graphics supercomputers, has backed Stardent since its inception. The amount of Kubota's total investment was unavailable.

Continued support for the rest of Stardent's hardware, such as the Vistra series based on Intel Corp.'s I860 processor, is unclear. The company only stated that it expects to conclude negotiations concerning a takeover of that product within 60 days.

TRENDS

Executive snapshot

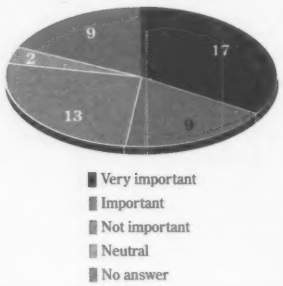
A roundup of opinions on various technologies from key IS executives

(Number of respondents: 50, multiple responses allowed)

What key technologies or "areas" will you focus on acquiring next year?

LANs	13
Image	8
Client/server	7
Communications	6
CASE	6
Workstations	4
AI	4
Business-specific	4
Mainframe upgrade	3
RISC	3

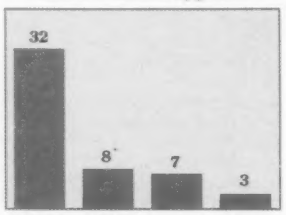
How important to your buying decision is a vendor's plan to adopt open systems?



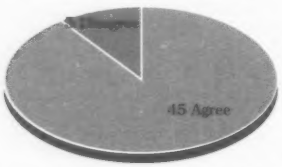
Do you see PC software vendors' upgrade policies as "nickle and diming" you to death?

Yes	28
No	14
No answer	6
Not sure	1
Won't use	1

How would you prefer PC software vendors to handle upgrades?



Given products of comparable quality, price and function, I am more likely to buy a product made by a U.S. company.



Source: Sierra/Alliance, Scottsdale, Ariz.

CW Chart: Michael Siggins

NEXT WEEK

Pressures to squeeze the most from technology dollars and keep end users happy are prompting many companies to expand or create user help desks. The more adventurous, including **Martin Marietta's Pam Morris** are combining internal and external help desks. See Executive Report for the latest advances and opportunities.

Jeff Blanton

Cooperative processing is coming to the Heartland — but slowly. Principal Financial Group in Des Moines, Iowa, one of the nation's largest life insurers, is not hopping onto the downsizing bandwagon, but it is looking into which applications would be more effectively shared between the mainframe and desktop worlds. See Manager's Journal.

INSIDE LINES

Sometimes, it's hard to Excel

▶ Having trouble running Microsoft's Excel 3.0 spreadsheet on Apple's new Quadra high-end Macintosh PCs? You're not alone. Microsoft officials say Excel 3.0 is incompatible with the copy-back caching scheme used by the Motorola 68040 chip implemented in the Quadra. Apple is now shipping a control device with the Quadras that allows users to turn off the cache so Excel can run correctly. If users want to take advantage of the caching in the new Quadras, they should call Microsoft customer service at (800) 426-9400 to obtain the maintenance release of Excel Version 3.0a. Version 3.0a also corrects problems users had when trying to copy Excel into other products, such as Macdraw.

A negative Lotus position

▶ At least one Wall Street analyst — and many investors — lost faith in Lotus last week. Cowen & Co.'s Michele Preston started the Lotus sell/Borland buy stampede when she said to drop Lotus stock and run, don't walk, to the nearest Borland counter (see story page 117). Underwhelming response to 1-2-3 for Windows might force Lotus to cut spending in early 1992, just when Borland plans to pour money into marketing Quattro Pro for Windows, Preston wrote in a customer memo. Meanwhile, she said, Borland is poised to become the Microsoft of the '90s. "Like Microsoft leveraged core operating technology in the '80s, Borland is positioned to leverage new object-oriented and database technologies," she asserted. Philippe Kahn and company officials said they expect to ship eight new products, including spreadsheets, databases and programming languages, during 1992's second quarter.

Zapped by the software police

▶ One of the latest on the Software Publishers Association's (SPA) hit list is Entrix, a Houston-based environmental analysis company. The company allegedly made illegal copies of several different programs, including about 30 copies each of Lotus Symphony and Microsoft Word, according to SPA spokeswomen. Eileen Rosenthal, counsel for the SPA, said that Entrix was being "extremely cooperative," and that the suit is currently being negotiated. Other companies under investigation include the following: Cato Corp., a Charlotte, N.C., womens' clothing retailer; Sgt. Fletcher Co., an El Monte, Calif., defense contractor; and Viasoft, a Phoenix-based software publisher.

Cooling off

▶ If IBM hoped to freeze the router market by prebriefing the press on its upcoming RISC System/6000 router, its strategy may backfire. Users said they expected to see a formal intro last month. Now there is speculation that IBM is having trouble getting all those routing protocols to run efficiently on a box that was not, after all, designed to be a communications system. On the plus side, there is strong evidence that IBM will shortly announce the AIX, RS/6000-based LAN management system it is working on with HP.

A sweet surprise

▶ Electronic Data Systems and McDonnell Douglas Systems Integration (MDSI) spent Halloween zeroing in on closure of the acquisition that will make the aerospace firm subsidiary a unit of the world's leading outsourcer. Due out any hour now, the announcement could turn out to be a bag o' goodies indeed, according to a source close to EDS: It may include a long-rumored outsourcing deal with MDSI parent McDonnell Douglas Corp.

You won't find IBM stock in the majority of investment portfolios of IS chiefs, according to a recent survey done by Salomon Brothers. About 65% of the 50 directors surveyed said "No, thank you" when asked if they would buy into IBM. "There's a general feeling IBM is in long-term decline," said analyst Steve Milunovich, who headed up the survey. Tech companies they would most like to own? From the top: Microsoft, Intel, Sun, Novell and Apple. Got any other hot tips? Enlighten our News Editor Alan Alper. Call him at (800) 343-6474, fax him at (508) 875-8931, or Compuserve him at 76537,2413.

A few months ago, some guys came by and stuck this on our windows.

PC MAGAZINE

EDITORS' CHOICE

And they weren't just any guys, either.

They were a group of editors from *PC Magazine*, and in their February 26th, 1991 issue, they had some awfully nice things to say about IRMA™ WorkStation for Windows.

BEST WINDOWS 3.0 3270 TERMINAL EMULATOR: IRMA WORKSTATION FOR WINDOWS V. 1.0. FEB. 26, 1991.

Some comments:

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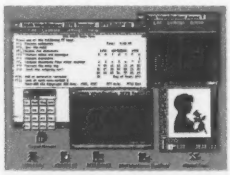

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DCA

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